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Editorial Note

It is with great pleasure and enthusiasm that we welcome you to the Volume 4 Number 1 issue of the International Journal of Arts, Architecture and Design (JAARD). We are honored to be a part of this scholarly endeavor and guide you through the world of artistic exploration, architectural innovation, and creative design thinking.

JAARD aspires to be a hub of intellectual discourse and creative expression in the realm of arts, architecture, and design. We are committed to providing a platform where original research, critical analysis, and innovative practices thrive. This journal is not only a repository of knowledge, but also a dynamic space for dialogue and collaboration among scholars, practitioners, and enthusiasts in the creative field.

Our editorial board comprises distinguished members who bring a wealth of experience and expertise to ensure the quality and rigor of the content published here. We encourage diverse perspectives and cross-disciplinary exchange, embracing a wide spectrum of topics from music to user experience design. We are honoured to share that our editorial board is enhanced with the addition of two distinguished members.

We invite you to explore the articles, essays, reviews, and commentaries presented in this volume. Your engagement and contributions will be vital in shaping the future of JAARD. We look forward to your scholarly pursuits and creative endeavors as we collectively explore the fascinating world of arts, architecture, and design.

JAARD is now indexed with Directory of Open Access Journals (DOAJ), DELNET and J Gate. This allows the authors work to reach a wider and appropriate audience.

Thank you for being a part of this exciting journey, and we eagerly anticipate the scholarly discoveries and innovations that will emerge through JAARD.

The Editors

Development of Factors for Measuring Brand Identity of Handicraft Brand for its Visual Identification

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ABSTRACT

Handicraft and Bihar, has a brilliant and unique connection, which adorns its aura. With the concept of brand in recent times, the handicraft sector too, needs to match with the need of the time, which is crucial for its longevity and sustenance. Thus, this paper is an attempt for Branding of Handicraft Brand, by exploring and developing factors responsible, for measuring its Brand Identity, in order to help in its Sustenance. This study highlights the importance and need of branding in the handicraft sector. Brand identity is crucial for the success of any product brand, hence, this study, advocates for Bihar handicraft (Sujani Embroidery of Bihar, with selected handicraft brand by Govt. of Bihar). The methodology adopted for this study is in-depth literature study from peer sources, for investigating the constructs responsible for development of brand identity followed under different product categories. Further, primary studies have been conducted in the form of Delphi Method, Questionnaire development, Survey and Factor Analysis, using Varimax rotation on SPSS. Based on the analysis, factors have been developed, which would help in defining the brand identity for handicraft brands, in order to help the brand in its identification by its stakeholders. This study is novel and unique, as no such study on handicraft sector has been done, which defines the factors responsible for measuring brand identity of handicraft brand, to the best of researcher's knowledge.

Keywords- Handicraft, Sujani, Sustenance, Bihar, Brand Identity, Visual Identification.

1. Introduction

Indian regional living traditions called Handicrafts, are dynamic which needs intervention to match the preferences of customers, in order to continue as a tradition. The intervention here accounts for its core characteristics, where the market needs to act as a driving force, i.e., customers. Numerous design interventions in handicrafts have been done in recent times, however, scarce/negligible interventions are done towards its branding and promotion, making it crucial for present time (Kumari & Karolia, 2017). Bihar Handicraft Industry, a backbone of cottage and small-scale industry, is in intense need for support, .i.e., market linkages and subsequently branding, for improved scalability and visibility. Regional history, culture and practitioners, are crucial areas in defining the identity of handicraft, and hence, its branding. It is a mode for identifying selected products, through its brand name, logo, packaging, quality, familiarity, reliability and symbolic emotions, commonly found in manufactured products, but needs its application in other possessions as well (Batra, Ahuvia, & Bagozzi, Brand Love, 2012). Thus, Brand Identity is explored

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and applied in this study, on Bihar Handicraft, with selected handicraft as Sujani Embroidery of Bihar.

Sujani Embroidery, is an important handicraft of Bihar, as is Madhubani Painting, but surprisingly lacks visibility and awareness among its customers. With Geographical Indication (GI) Tag in 2006, Sujani Embroidery, struggling in terms of profit margins, market acceptance, awareness, etc. (Banhi, 2019). Also, Sujni Embroidery of Bihar is largely confused with Kantha Embroidery of West Bengal, because of the similarity in its nature and visual aesthetics, but have contrasting differences (Naik, 1996). 'Su' (propitious) and 'Jani' (birth), is what Sujani means, done using Running, Harua and Sikadi Stitches, bringing out eternal emotions, through its product categories, comprising of, quilts, bedsheets, cushions, sarees, dress materials, dupattas, kurtas, etc. (Naik, 1996) (Banhi, 2019).

In view of above, gap in the study found w.r.t. Sujani Embroidery of Bihar, poses the scope in study, in the areas of its branding, for its identification, through its Brand Identity. Thus, this paper is an attempt to investigate and develop factors which are responsible for creation of Brand Identity of Handicraft Brand. This study incorporates the reference of the brand, named, Bihar Khadi, by Govt. of Bihar, associated with traditional Sujani Embroidery along with rural products of Bihar. Here, in this paper, the study on Brand Identity of handicraft brand (Bihar Khadi) is based on Kepferer's Model of Brand Identity (Prism Model, 2004), having 06 facets .i.e., Physique, Relationship, Reflection, Personality, Culture and Self Image. This model is crucial in the development of Brand Identity, by understanding customer's view and perception for effective interaction between the brand and its customers, for a long-lasting relation (Teresa Barros, 2016). It is a method to find out the brand identity of any brand, which has been applied and tested for selected handicraft and handicraft brand in this paper.

2. Literature Review

2.1 Handicraft

As per UNESCO, handicrafts are made by artisans, using hands, using basic tools and devices, to create authentic, traditional, cultural, emotional, decorative and heritage products. Its characteristics and iconography are interrelated with the role of practitioners, consumers' need and market trend (Kumari & Karolia, 2017) (Kumar, 2020). Handicrafts are indigenous, with socio-cultural and religious connections, reflecting its originality and expressing the identity of the region and its creators (Donkin, 2001). This sector is labor-extensive due to unsystematic operations, and hence, decreasing its economic value (Raharjo, 2021), making it crucial to work for its branding. Brand Identity is successfully applied in various products but the handicraft sector is lagging in applications of labelling (Donkin, 2001). Bihar is in dire need of support for its traditional arts, the backbone of cottage and small-scale industry, for improved market, personified branding and access to credits (Panigrahi, 2017).

2.2 Sujani Embroidery, a traditional Bihar Handicraft

Bihar, the land of Mahavira, Gautam Buddha, Nalanda University, Aryabhatta, etc., is immensely proud of its roots. State economy is primarily based on agriculture and then on textiles and handicrafts. Sujani embroidery, a traditional and recyclable needle-work as shown in Fig 1, with origin from Bhusra Village of Bihar, has been serving the strongest bond of mother and child, in the form of quilted sheets, for covering newborn babies and other products (Ranjan & Ranjan, 2007). It is estimated to have originated around 1920s, with motifs like mother and child, natural resources, flora and fauna, etc., with a look-alike of Kantha Embroidery of Bengal, due to the technique involved

(quilting), however significant differences exist (Naik, 1996). Sujani Embroidery of Bihar, diminished, due to overpowering Kashida Embroidery of Kashmir, Kantha Embroidery of Bengal and Kasuti Embroidery of Karnataka (Kumar, 2020). With tough competition from Kantha Embroidery of Bengal, there is least awareness and market acceptance for Sujani of Bihar, in spite of the award of GI tag, thus, needs interventions for profitability, sustainability, market, recognition, awareness, etc. (Banhi, 2019).

2.3 Bihar Khadi

Bihar Khadi, an enterprise of Bihar Rajya Khadi Gramodyog Bhawan, Patna, Govt. of Bihar, launched in the year 2019, focuses on rural products of Bihar, with Sujani Embroidery being one among it. This brand has been working tirelessly, in spreading the awareness among its customers, through both online and offline platforms (Khadi Mall, Patna), showcasing the blend of tradition and culture to its customers. The logo of the brand is as shown in Fig 2.

Fig 1: Sujani Embroidery of Bihar *(Courtesy: Self)*

Fig 2: Logo of the brand, Bihar Khadi *(Courtesy:* (Khadi, n.d.)

2.4 Branding and Branding of Handicraft Products

Branding is essential, as nothing goes unbranded (Kotler & Armstrong, 2018). Brand is the identification mark of a seller/maker, to develop reputation with customers and satisfy their needs (Keller & Lehmann, 2006) (Kotler & Armstrong, 2018). Perceptions, feelings and identification of the brand, are common for manufactured, but is required in other categories too (Batra, Ahuvia, & Bagozzi, 2012). Indian rural products (handicrafts and food grains), are mostly sold unbranded (no packaging and labelling), thus, decreasing their value proportions (Nair, 2012), making branding essential for the handicraft sector.

As per model of Core Customer value (Kotler & Armstrong, 2018), handicraft products fall under the category of "Actual Products", with requirement of Brand name, features, design, packaging and quality level (as shown in Fig 3). It includes: Product quality- functionality, durability, operation, etc (Kotler & Armstrong, 2018), Product features- uniqueness and newness in products (Kotler & Armstrong, 2018), Product design- effective aesthetics and styles (Naderi, Naderi, & Balakrishnan, 2020), Packaging – aesthetic product presentation through packaging (Naderi, Naderi, & Balakrishnan, 2020), Branding – set of name, sign/symbol/design, for identification and differentiation of products from others (Haigh & Knowles, 2004).

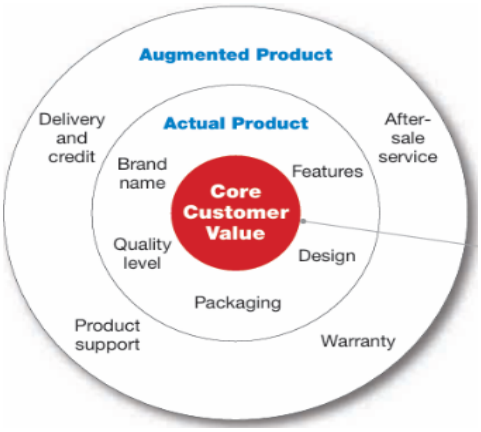

Fig 3: Levels of Product *(Courtesy: Kotler & Armstrong, 2018*

For small craft producer brands, product categories, style, qualities, colour, material, care, service, warranty and guarantee, etc, needs to be assured to the retailers and customers, to develop customers' trust and loyalty (Makhitha, 2016). Successful brands have strong associations of self, culture (Holt, 2002) and tradition, which gives competitive advantages (Vanolo, 2010). Local assets, stabilizes the brand, making it a crucial area for brand formation (Vivant, 2010). The identity of handicrafts and its practitioners, as a combination, develops a strong identity. Local identity and image of brands are the future of branding (Therkelsen & Halkier, 2004).

2.5 Brand Identity

Brand is a package of feelings, behavior, identity, packaging, communications, and environments (Brakus, Schmitt, & Zaranto, 2009). Branded products are in huge demand, due to its important areas as traditions, quality, values, identity (personal and group), status and marketing communication (Strizhakova, Coulter, & Price, 2008). The brand conveys it's message to customers through its brand identity (Nandan, 2005), which develops trust, identity and distinguish itself from its competitors (Ghodeswar, 2008), as a trademarked item (Keller & Lehmann, 2006) (Farhana, 2014). Brand identity can be positioned through its brand positioning, communication, brand performance and brand equity (Ghodeswar, 2008). Internal (internal involvement) and external (customers) communications, are important for Brand Identity (Aaker, 1991). Thus, in handicraft sector, culture, relation, quality, values, identity, image, personality, etc. might have huge contribution and impact, hence, Kepferer's Prism Model (pioneer of Brand Identity), is reviewed for its applicability in handicraft sector too in this paper. Kepferer's Prism Model (2004), comprises of 06 facets (Fig 4): Physique, Relationship, Reflection, Personality, Culture and Self Image, for Brand Identity development by understanding customer's views, perception and communication (Farhana, 2014) (Teresa Barros, 2016). This model is tested for selected handicraft and handicraft brand in this paper. The facets of Kepferer's Prism Model are explained as under:

- **Physique –** consists of external physical features/materials, color and qualities.
- **Personality -** identifying products/services as a human (human personality traits), through its pattern, design, color, symbolic spokesperson, etc.
- **Reflection -** reflecting perception of customer which they wish to be identified or visualized as (identification of user).

- **Self-image –** representation of actual image of customers, drawn during their purchase/usage of products.
- **Culture -** brand principles & values, having strong connections between brand and customers.
- **Relationship -** relation between brand and its customers, through its services and behaviors.

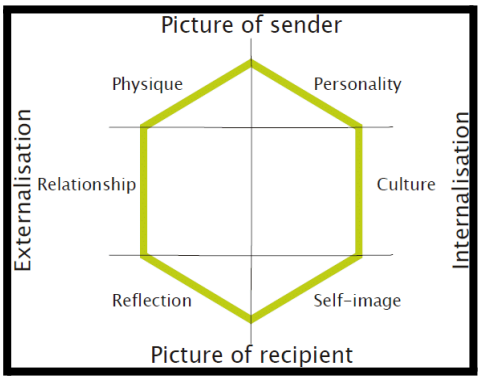

Fig 4: Kepferer's Brand Identity Prism (Courtesy: Kapferer, 2004)

On reviewing various studies on brand identity based on Kepferer's Model, clearifies that, brand is personified, hence, vision and values, though its image and personality, are core of brand identity (Krake, 2005). Different studies conducted by researchers on Kepferer's Prism Model, in varied products/services, for Brand Identity, brings out its relevancy in varied products. Over a period, it has been found that not much has been explored for measuring the identity of art and craft industry, w.r.t. image, awareness and identity (Melewar & Jenkins, 2002).

3. Methodology

The methodology adopted for this study are in 02 parts, making it both qualitative and quantitative in nature, which are as follows: -

- **Secondary Study** – Extensive review and collecting of constructs and items (questions) from secondary study, from peer sources, has been done, as per its suitability on handicraft, for finding out the factors responsible for Brand Identity of handicraft brand (as shown in Table 1, Round 1).
- **Primary Study** – This study has been conducted in 02 parts, which are as follows:
    - **Delphi Method of Communication** – To arrive at convergence of different opinions of experts for constructs of Brand Identity (Refer Table 2 (Round 2) & 3).
    - **Survey** – Questionnaire developed out of constructs from Delphi Method, has been used for conducting the survey on sample size of 80.
    - **Factor Analysis using SPSS** – Data Analysis on SPSS and based on the factor loading generated, development of factors responsible for Brand Identity of handicraft brand (Refer Table 4, 5 & 6).

3.1 Sampling

Judgmental sampling (non-probability) has been adopted for selection of experts for Delphi Method, which included: (1) Brand Developers and Handicraft Specialists (2) Eminent academicians in the country having hold in required area (3) Officials of the brand selected, having clear vision of the brand.

3.2 Sample Size

14 experts for Delphi Method of Communication and sample size of 80 for conducting surveys on Brand Identity have been included.

3.3 Sample Frame

Initial structured questionnaire (post Delphi Method), circulated among the samples, for survey, comprising Brand managers, experts and consultants, brand officials, handicraft officials of State and Central Govt. and academicians, representing as samples of customers as well. Selection of sample frames for this study, is referred from previous studies by (Emari, Jafari, & Mogaddam, 2012) and (Wong & Merrilees, 2008).

3.4 Methods and tools Used

The method used for conducting Primary Study has been done in parts comprising of Delphi Method of Communication, Survey and Factor Analysis on SPSS, which are as follows:

- **Part A- Delphi Method of Communication Procedure**
  - Arrived at convergence of different opinions for constructs on Brand Identity through Delphi Method, to structure the questionnaire (items/questions under each construct by experts), with further decision on the rate of scale. The number of experts for the Delphi method could range from 10-18 (Okoli & Pawlowski, 2004), hence, 14 experts (as per the required expertise) have been selected for this study. The experts were briefed (both telephonically and in person, depending on their availability) about the study, their role and method to be followed (experts' details are kept confidential, looking into the interest of the experts).
  - Table 2 given below, shows: Round 1- Extraction of Constructs & Items of Brand Identity from secondary studies, Round 2 - Secondary data adapted for current study and introduced for Delphi Method procedure, for experts' review, with further addition/deletion of items done as per expert's review, Round 3 – items under each contsucts rated by all 14 experts on a Likert scale of 1-5 (1- stronly disagree, 5-strongly agree), with extraction of items scoring more than 50% for inclusion in Structured Questionnaire. Table 3 shows the procedures followed for conducting Delphi Method of Communication and Scale Development for Extracting Different Constructs of Brand Identity.

Table 1 & 2: Constructs & Items of Brand Identity adapted from various Secondary Studies, Procedures followed for Conducting Delphi Method of Communication and Development of Scale

Round 1 (Secondary Study)				Round 2 (Delphi Method)	
Construct	Items	Likert Scale	Adapted from Source	Items Adapted / Added as per Expert	Items added by Experts
Physique	Trend	1-5	(Farhana, 2014)	Trend	
	Tradition			Traditional heritage	
	Quality			Standard	
	Sophisticated		(Barros, 2014)	Sophisticated	
	Modern			Smart	
Personality	Stylish	1-5	(Farhana, 2014)	Modern	

	Reliable			Dependable	
	Friendly	1-5	(Naresh, 2013)	Jovial	
	Neuroticism		(Matzler, Strobl , Sauer, & Bobovnicky , 2016)	Abnormality	
	Emotional Stability			Emotional Stability	
	Intellect			Intelligent	
	Conscientious			Conscious	
	Chic	1-5	(Barros, 2014)	Pleasant	
	Reliable	1-7	(Geuens, Weijters, & Wulf, 2009)	Reliable	
	Realistic			Realistic	
	stable			stable	
	Advanced			Advanced	
	innovative			innovative	
	Passionate			Passionate	
	sentimental			sentimental	
	Confident			Confident	
	Energetic			Energetic	
	Fearless			Fearless	
					Confident, Fearless
Culture	Traditional	1-5	(Farhana, 2014)	Tradition	
	Swedish value			Indianness	
					Lavish, Cheerful, Compassionate, Kind-hearted, Pleasing, Elegant
Self-image	Feminine	1-5	(Farhana, 2014),	Feminal	
	Trendy			Fashionable	
	Prepared	1-5	(Barros, 2014)	Prepared	
	Proud			Gratifying	
	Satisfied			Glad	
	Confident of future			Competent	
	Elite			High-class	
					Independent, Elegant
					Empathetic, Social, Aware, Refreshing, Joyful, Experiment
Reflection	Aware	1-5	(Farhana, 2014),	Knowledgeable	
	Creative			Artistic	
	Joy			Delighted	

	Capable of creating / innovating			Expert	
	Successful professionals			Empowered individual	
	Professionals with high credibility			Proficient	
					legant
Relationship	Creativity	1-5	(Farhana, 2014),	Innovating	
	Lovely inspiration			Creativity	
	Friendly	1-5	(Barros, 2014)	Affectionate	
	Respectful			Reverent	
	Trustable			Integrity	

** Note:- Only those items under each construct which got selected in Delphi method of Communication have been included in this table.*

Table 3: Procedure followed for conducting Delphi Method of Communication and Scale Development for Extracting Different Constructs of Brand Identity

	Procedure to develop the scale (items)/Questionnaire	Techniques and Indicator
Round 1	Identified constructs of brand identity, items generated and relevant items adapted for the handicraft sector.	Constructs and items from previous studies (Refer Table 2)
Round 2	Pool of items administered to experts, for convergence of opinions on Brand Identity of handicraft brand, with constructs based on 06 facets of Kepferer's Prism Model.	Recorded feedback on addition/deletion of items from the pool. Multiple constructs with items, having overlapping meaning, were dropped, to avoid duplicity (Refer Table 2).
	Refined set of constructs with respective items compiled.	Incorporated comments of addition/deletion of items in MS Excel (Refer Table 2)
Round 3	Refined pool of items presented to experts.	Experts rated items on a Likert Scale of 1-5 (1=strongly disagree, 5= strongly agree) (Refer Table 2)
	Experts' rating, loaded in MS Excel against each item and derived its average ratings.	14 experts rated on a scale of 1-5 = 70 (5 x 14) Average/mean of each item done = 35 for shortlisting of items. Items scored < 35 dropped and items scored ≥ 35 included in Excel sheet for further steps.
Round 4	All items with score ≥ 35, compiled, to form initial structured questionnaire	Structured questionnaire developed on Google form and generated its link.
	Survey conducted on sample size of 80 with accepted responses from 34, based on Convenience Sampling.	Questionnaire circulated for survey, to 80 respondents and data entry done in MS Excel. On survey completion, questionnaire filtered (considered) for respondents, aware of the selected brand and those fully answered, for further analysis. A target of approx. 30 was set, however, the received responses from 34 samples were considered for further analysis. A total of 34 sample size has been confirmed (adapted from previous studies), due to the structured simulation of the factors as a result (de Winter, Dodou, & Wieringa, 2009). Also, the sample size has been decided based on the very nature of the data collected (load value of 0.8 in nearly every component and also less number of factors, showing a robust nature (Lingard & Rowlinson, 2006). It also led to convenience in conducting the study by the researcher.

- **Part B-** Quantitative study on Statistical Analysis of Brand Identity done through Factor Analysis in following steps:
  - ✔ Responses of 34 samples coded in MS Excel, as per requirement of SPSS for factor

analysis.

- ✔ Result of factors generated through: Extraction Method, Principal Component Analysis (PCA), Rotation Method, Varimax and Kaiser Normalization, Bartlett's Test with Rotated Component Matrix, along with its mean and standard deviation (Refer Table 4).
- ✔ Items with factor loading ≥ 0.6 considered (Refer Table 5), for factor development, referring to previous studies (cut-off loading value as 0.6 referred from previous studies). Low loaded items were dropped, along with those items which scored acceptable factor load were dropped ("Expert" under the construct "Reflection"), to have a shorter scale (reference from previous study). Wherever required, item(s) with factor load of 0.5 has been considered to complete the construct.
- ✔ Developed Final factors for measurement of Brand Identity of Handicraft Brand (Bihar Khadi), dealing with Sujani Embroidery of Bihar (Ref. Table 6).

4. Results & Discussion

The responses collected from the survey, coded, as per the requirement of SPSS and loaded on SPSS for results generation. Factor Analysis Method has been applied for the generation of results. The result of factors generated through varied methods .i.e., Extraction Method, Principal Component Analysis (PCA), Rotation Method, Varimax and Kaiser Normalization, Bartlett's Test with Rotated Component Matrix (Refer Table 4), Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy value as .545, Bartlett's Test of Sphericity (Approx. Chi Square- 1.011, df- 4965, Sig.- .000), along with its mean and standard deviation. The results generated are shown in Table 4 below, showing the result as significant.

Table 4: KMO and Bartlett's Test of Constructs of Brand Identity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.545
Bartlett's Test of Sphericity	Approx. Chi-Square	1.011E3
	df	496
	Sig.	.000

Based on the above significant values and results, as shown in Table 4, the method of Rotated Component Matrix, derived the factor loading of each item (question) on SPSS, falling under 8 different components, as shown in Table 5. The acceptable factor load ≥ 0.6 or above (highlighted in colour in Table 5), with factor loading values < 0.6 dropped. Items in each component selected as (Table 5): -

- Component 1- 06 selected items with factor loading above 0.6 (highlighted).
- Component 2 - 03 selected items with factor loading above 0.6 (highlighted) along with addition of 4th item (Indigenous) due to its significance in that component, in spite of having a factor load of 0.564, hence 04 items derived in this component.
- Component 3- 04 selected items with factor loading above 0.6 (highlighted).
- Component 4- 03 selected items with factor loading above 0.6 (highlighted).
- Component 5- 02 selected items with factor loading above 0.6 (highlighted).
- Component 6 – for consideration of a component, at least 02 items to fall under the acceptable factor load. 01 item read factor loading ≥ 0.6, hence, due to less items ≥ 0.6 (low significance), this component has not been considered.
- Component 7– 01 selected item read factor loading above 0.8 (high significance), as such for considering this component, 01 item with factor load of 0.572, has been selected to have at

least 02 items in this component, hence, 02 items selected under this component.

- Component 8 – for consideration of a component, at least 02 items to fall under the acceptable factor load. 01 item read factor loading ≥ 0.6, hence, due to less nos. of item ≥ 0.6 (low significance), none of the item got selected in it. So, component 06 has not been considered.

Therefore, 06 components, highlighted in Table 5, have been considered for further analysis in the study.

Table 5: Rotated Component Matrix on SPSS for Brand Identity

Items	Component							
	1	2	3	4	5	6	7	8
Proficient image to be achieved on purchase from the brand.	.821							.334
Image of empowered individual to be achieved on purchase from the brand.	.809							
Artistic image to be achieved on purchase from the brand.	.771	.342						
Knowledgeable image to be achieved on purchase from the brand.	.748	.422						
Elegant image to be achieved on purchase from the brand.	.689	.329						
Expert image to be achieved on purchase from the brand.	.676						.304	-.324
Delighted image to be achieved on purchase from the brand.	.594		.406			.364		
Brand communicates its values and vision as Compassionate.		.808						
Brand communicates its values and vision as Kind-hearted.		.751						
Brand communicates its values and vision as Traditional.		.664					.392	
brand communicates its values and vision as Indigenous.		.564	.350	.330			.372	
Imagining this brand to be a person, as Intelligent.		.523		.314	.321			
Imagining the brand to be a person, as Dependable.	.429	.499	.306	.341				
Imagining the brand to be a person, as Modern.			.776	.301				
Imagining the brand to be a person, as Advanced.	.372		.755					
Imagining the brand to be a person, as Active.		.366	.663					
Imagining the brand to be a person, as Pleasant		.373	.606			.415		
Shape & form of handicraft describes the physical features of the brand,			.519		.390	-.340		
Your gratified identity is communicated to the brand.				.834				
Your gleeful identity is communicated to the brand.				.707				
Your competent identity is communicated to the brand.		.431		.636				
Imagining the brand as a person, the brand is realistic.	.474	.385		.564				
Color as the brand physical features, describes the handicraft.					.851			
Texture/hand feel as the brand physical features describe the handicraft.					.805			
Brand communicates its values and vision as cheerful.				.321	.547	.430		
Feminine message of your identity is communicated to brand.				.422		.680		
Imagining the brand to be a person, as jovial.			.502			.563		
Imagining the brand to be a person, as reliable.	.419					.471		
Respectful relation between you and the brand, strengthen its brand value.							.848	
Integrity between you and the brand, strengthen its brand value.		.316					.572	.501
Your elite identity is communicated to the brand.	.308			.335				.667
Your elegant identity is communicated to the brand.	.412			.512				.596

On derivation of selected factors from above table, the selected items (questions) with the factor loading ≥ 0.6 has been listed under each construct (as per Kepferer's Prism Model) in Table 6. Also, items as Expert in 1st component has been dropped even after the acceptable factor load (0.676), in order to have a shorter scale further (adopted from previous studies). Thus, the Table 6, given as under, shows items falling categorically under each facet of Kepferer's Prism Model of Brand Identity, as: Reflection, Culture, Personality, Self-Image, Physique and Relationship, which has been taken up for this study, due to it applicability on the selected area too.

Table 6 below shows 06 Factors with respective items under it, for measuring Brand Identity of handicraft brand (Bihar Khadi) dealing with Sujani Embroidery of Bihar. The 06 factors, based on Kepferer's Prism Model, has been tested and applied fully on handicraft sector too. Thus, the 06

factors confirmed and developed in this study, is on the basis of Kepferer's Prism Model.

Table 6: Factors for Measuring Brand Identity of Handicraft Brand on Kepferer's Prism Model *(Courtesy: Result derived by self)*

No.	Item	Original Construct	Explanation through visual color story	No.	Item	Original Construct	Explanation through visual color story
PHYSIQUE			Visual of a fabric	**RELATIONSHIP**			Core of existence
1	Color	Physique		1	Respect	Relationship	
2	Texture / hand feel	Physique		2	Integrity	Relationship	
PERSONALITY			Match to the need of time	**CULTURE**			Nature of authenticity
1	Modern	Personality		1	Compassionate	Culture	
2	Advanced of time	Personality		2	Kind-hearted	Culture	
3	Active	Personality	Behavioural reflection	3	Traditional	Culture	
4	Pleasant	Personality		4	Indigenous	Culture	
REFLECTION				**SELF-IMAGE**			Self-confidence
1	Proficient	Reflection		1	Gratifying	Self-image	
2	Empowered individual	Reflection		2	Glad	Self-image	
3	Artistic	Reflection		3	Competent	Self-image	
4	Knowledgeable	Reflection					
5	Elegant	Reflection					

The result of this study is very novel, to the best of researcher's knowledge. Kepferer's Prism Model of Brand Identity has been tested and applied on the Handicraft Brand named Bihar Khadi dealing with Sujani Embroidery of Bihar. Surprisingly, the 06 facets of Prism Model, resulted in perfect application for handicraft brand too, which majorly till now, has been applied on varied product brands, but not on handicraft brand. Table 6, shows 06 different facets of Prism Model applied on current handicraft study, wherein the result generated all the facets of Prism Model as the Factors for Brand Identity of Handicraft Brand too .i.e., Physique, Personality, Culture, Self-Image, Reflection, Relationship. Each factor developed have items defined, describing the factors, to help in developing its Brand Identity and further develop its branding and collaterals, for its visual identification.

The study resulted in factors responsible for Brand Identity of Handicraft Brand (Bihar Khadi), based on Sujani Embroidery of Bihar, which are as follows:

- **Physique -** clearly narrates the importance of physical look of the brand, which is highlighted based on its color theory and Texture/hand feel of the product brand, reflecting in the brand's branding.
- **Personality-** this factor intricately elaborates the personality trait of this brand as Modern, Active, Advance of time, Pleasant, which reflects in its brand identity.
- **Culture -** this has a strong connect and representation of the region, hence this factor is strongly defined with Compassionate, Kind-hearted, Traditional, Indigenous.
- **Self-Image -** this is a mirror of self, hence Gratifying, Glad, Competent, are the association under this factor which is applicable on handicraft brand too.
- **Reflection** - the perception or desire of the customer to be reflected from their purchase/usage activities of Bihar Khadi products are, Artistic, Expert, Knowledgeable, Proficient, Elegant, Empowered Individual.

- **Relationship** – this factor being the most important factor in maintaining the bond and connect between Bihar Khadi and its customers in long run, due to the essential qualities possessed by this brand which are Respect, Integrity**.**

Based on above results and findings, Fig 5, as under, has been derived and developed, on Kepferer's Prism Model of Brand Identity by the researcher, highlighting the Brand Identity of selected brand (Bihar Khadi), based on selected handicraft (Sujani Embroidery of Bihar). Thus, the findings of this study (Fig 5), shows the applicability and suitability of Kepferer's Prism Model on Handicraft Brand too. Fig 5, has been derived by the author on the basis of the results and findings of this study.

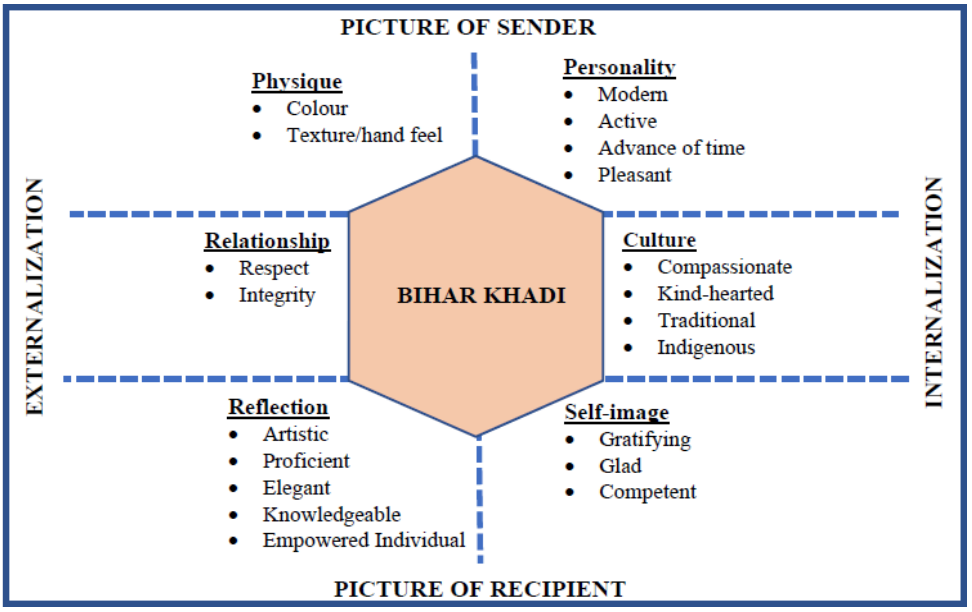

Fig 5: Application of Kepferer's Brand Identity Prism Model (2004) for Brand Identity of handicraft brand (Courtesy: Result derived by self)

From this study, it is found that, Kepferer's Prism Model of Brand Identity, is applicable on handicraft brand too. Due measures have been taken for meeting the parameters of reliability and validity, for getting the result. The factors mentioned above, are a good source for the identification of the brand Bihar Khadi, dealing with Sujani Embroidery of Bihar. Thus, the factors found and developed in this study, would be helpful in identification of the brand (Bihar Khadi) on visual norms for its stakeholders. Therefore, based on Kepferer's Prism Model, following areas to be considered while developing its brand identity, be it brand logo, name, marketing and visual merchandising, collaterals, packaging, etc.:-

- **Physique-** the physical view of handicraft craft brand, which is tangible and its backbone, is recommended to incorporate the color (original colors of the handicraft) and texture/hand feel (interesting and authentic surface from the handicrafts), which would act as the first impression and view of the brand to its stakeholders, describing about its identity of handcrafted. This physical quality of the brand is to be narrated pronouncedly in different areas of branding, to display its strong identity.
- **Personality -** the handicraft brand should be personified in an interesting manner, matching with the pace of the time. The celebrities as brand ambassadors/endorsers/spokesperson, must have a pleasing, modern and fast-forward personality, which would create the personality of

the brand. This would help in associating its customers strongly with the brand, with their similar nature/personality as those of the handicraft brand.

- **Culture –** a very strong facets in brand identity, which speaks volume about the regional essence and its features, in the form of direct connections between the brand and its customers, through its principles and values, which is more towards a ground to earth with display of traditional and indigenous vibes.
- **Self-image –** the handicraft brand is recommended to inculcate the image of its associated customers as a gleeful, gratitude and competent customer, through different ways of its branding.
- **Reflection –** the handicraft brand is recommended to have an impression reflecting from its customers as artistic, experiential, knowledgeable, elegant, proficient and empowered nature, through its branding.
- **Relationship –** this being another very crucial tangible facet of handicraft brand, and therefore, the behavior between the brand and its customers to be focused, and recommended to have a respectful and integrity-oriented approach.

5. Conclusion

The results and findings of this study as mentioned above .i.e. Physique, Personality, Culture, Self-Image, Reflection and Relationship, are the areas, which plays an important role in defining the Brand Identity of Handicraft Brand (Bihar Khadi). The brand which is dealing with traditional works of Bihar, have its core identity intact based on the above factors. With such strong brand identity development, it would be a blessing for such traditional handicraft of Bihar, Sujani Embroidery, to get back its recognition and acceptability among its customers and contribute significantly in the economy of Bihar as well as of India.

The above factors, are to be applied on development of brand identity of handicraft brand too, which may be applied on another brand too, dealing with different handicrafts/brand of different state/any international brand. The 06 factors of Kepferer's Model have been found fully applicable in this case, however, other handicraft brand of different craft segment, may test the same for its applicability, for adoption as fully or partially.

The present study, would be highly relevant and a great source of information for academicians, scholars, brand officials, Bihar Govt., Indian Govt., practitioners, upcoming handicraft brands, entrepreneurs, etc., in defining the Brand Identity of Handicraft Brand. This study would also add on the literature and help Sujani Embroidery of Bihar, the traditional embroidery, is regaining its legacy, by creating awareness among the present and future generations to follow.

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References

Banhi, J. (2019). Sujni Embrodiery and Community Practice in Bihar. International Association of Societies of Design Research Conference, 1-10.

Barros, T. (2014). Corporate brand identity in higher education. International Conference on Innovation and Entrepreneurship in Marketing and Consumer Behaviour.

Batra, R., Ahuvia, A., & Bagozzi, R. P. (2012). Brand Love. Journal of Marketing, 1-16.

Batra, R., Ahuvia, A., & Bagozzi, R. P. (2012). Brand Love. Batra, R., Ahuvia, A., & Bagozzi, R. P. (2012). Brand Love. Journal of Marketing, 76(2), 1–16. doi:10.1509/jm.09.0339 , 1-16.

Bilgili, B., & Ozkul, E. (2015). Brand Awareness, Brand Personality, Brand Loyalty and Consumer Satisfaction Relations in Brand Positioning Strategies (A Torku Brand Sample). Journal of Global Strategic Management.

Brakus, J. J., Schmitt, B. H., & Zaranto, L. (2009). Brand Experience:What Is It? How Is It Measured? Does It Affect Loyalty? Journal of Marketing, 52-68.

de Winter, J. C., Dodou, D., & Wieringa, P. A. (2009). Exploratory Factor Analysis With Small Sample Sizes. Multivariate Behavioral Research, 147–181.

Dennis , C., Papagiannidis, S., Alamanos, E., & Bourlakis, M. (2016). The role of brand attachment strength in higher education. Journal of Business Research, 1-9.

Donkin, L. (2001). cultural, social and religious significance. ICCROM e-doc.

Emari, H., Jafari, A., & Mogaddam, M. (2012). The mediatory impact of brand loyalty and brand image on brand equity. African Journal of Business Management, 5692-5701.

Farhana, M. (2014). Implication of Brand Identity Facets on Marketing Communication of Lifestyle Magazine: Case Study of A Swedish Brand. Journal of Applied Economics and Business Research, 23-41.

Geuens, M., Weijters, B., & Wulf, K. D. (2009). A new measure of brand personality. Intern.ational Journal of Research in Marketing, 97-107.

Ghodeswar, B. M. (2008). Building brand identity in competitive markets: a conceptual model. Journal of Product & Brand Management, 4-12.

Haigh, D., & Knowles, J. (2004). How to define your brand and determine its value. Marketing Mangement, 22-28.

Holt, D. B. (2002). Why Do Brands Cause Trouble? A Dialectical Theory of Consumer Cultureand Branding. Journal of Consumer Research, 70-90.

Keller, K. L., & Lehmann, D. R. (2006). Brands and Branding: Research Findings and Future Priorities. Marketing Science, 740-759.

Khadi, B. (n.d.). Bihar Khadi. Retrieved from Bihar Khadi: https://biharkhadi.com/

Kotler, P., & Armstrong, G. (2018). Principles of Management. London: Pearson Education Limited.

Krake, F. B. (2005). Successful brand management in SMEs: a new theory and practical hints. Journal of Product & Brand Management, 228-238.

Kumar, V. (2020). A Historical Study of Craft and Craftsman in Bihar. Journal of Ideal Research.

Kumari, P., & Karolia, A. (2017). Craftsman and consumer: need driven innovation for handloom silk of bihar. In B. M. Toolika Gupta, A Treatise on Recent Trends and Sustainability in Crafts & Design (pp. 42-48). Jaipur: Excel India Publishers, New Delhi.

Lingard, H., & Rowlinson, S. (2006). Sample size in factor analysis: why size matters.

Makhitha, K. M. (2016). Marketing Strategies Of Small Craft ProducersIn South Africa: Practices and Challenges. The Journal of Applied Business Research, 663-679.

Maskey, R., Fei, J., & Nguyen, H. O. (2018). Use of Exploratory Factor Analysis in Maritime Research. The Asian Journal of Shipping and Logistics, 091-111.

Matzler, K., Strobl , A., Sauer, N. S., & Bobovnicky , A. (2016). Brand personality and culture: The role of cultural differences on the impact of brand personality perceptions on tourists' visit intentions. Tourism Management, 507-520.

Melewar, T. C., & Jenkins, E. (2002). Defining the Corporate Identity Construct. Henry Stewart Publications.

Naderi, E., Naderi, I., & Balakrishnan, B. (2020). Product design matters, but is it enough? Consumers' responses to product design and environment congruence. Journal of Product & Brand Management, 939-954.

Naik, S. D. (1996). Traditional Embroideries of India. New Delhi: A.P.H. Publishing Corporation.

Nair, D. (2012). Branding Imperatives for Handicraft Products. Management vision, 34-45.

Nandan, S. (2005). An exploration of the brand identity - brand image linkage: A communications perspective. Journal of Brand Management, 264-278.

Naresh, S. G. (2013). Do brand personalities make a difference to consumers? Procedia - Social and Behavioral Sciences (pp. 31-37). Elsevier.

Okoli, C., & Pawlowski, S. D. (2004). The Delphi method as a research tool: an example, design considerations and applications. Information & Management, 15-29.

Panigrahi , A. (2017). Cultural diversity of varanasi & its impact on visual identity of soft stone craft, ramnagar: a perspective of design led innovation to empathize multiplicity. In T. Gupta , B. Mistry, & B. S. Gupta, A treatise on Recent Trends and Sustainability in Crafts & Design (pp. 51-62). Jaipur: EXCEL INDIA PUBLISHERS .

Panigrahi, A. (2017). Cultural diversity of varanasi & its impact on visual identity of soft stone craft, ramnagar: a perspective of design led innovation to sympathize multiplicity. In T. Gupta, B. Mistry, & B. S. Guota, A treatise on Recent Trends and Sustainability in Crafts and Design (pp. 51-62). New Delhi: Excel India Publishers.

Panigrahi, A. (2017). Cultural diversity of varanasi & its impact on visual identity of soft stone craft, ramnagar: a perspective of design led innovationto empathize multiplicity. In T. Gupta, B. Mistry, & B. S. Gupta, A treatise on Recent Trendsand Sustainability in Crafts and Design (pp. 50-62). New Delhi: Excel India Publishers.

Panigrahi, A. (2017). Cultural Diversity of Varanasi & Its Impact on Visual Identityof Soft Stone Craft, Ramnagar: A perspective of Design Led Innovationto Empathize Multiplicity. A treatise on Recent Trends and Sustainability in Crafts & Design (pp. 51-62). Jaipur: Excel India Publishers, New Delhi.

Priyanka Kumari, A. K. (2017). Craftsman and consumer: need driven innovation for handloom silk of Bihar. In B. M. Toolika Gupta, A Treatise on Recent Trends and Sustainability in Craft & Design (pp. 42-48). Jaipur: Excel India Publishers.

Priyanka Kumari, A. K. (2017). Craftsman and Consumer: need driven innovationfor handloom silk of Bihar. In B. M. Toolika Gupta, A Treatise on Recent Trends and Sustainability in Crafts & Design (pp. 42-48). New Delhi: Excel India Publishers.

Raharjo, T. (2021). Indonesian New Exporter (INE) as a Training and Development Model Micro Small and. Turkish Journal of Computer and Mathematics Education , 5063-5071 .

Ranjan, M. P., & Ranjan, A. (2007). Handmade in India: Crafts of India. New Delhi: Council of Handicraft Development Corporations.

So, K. K., King, C., Hudson, S., & Meng, F. (2017). The missing link in building customer brand identification: The role of brand attractiveness. Tourism Management, 640-651.

Strizhakova, Y., Coulter, R. A., & Price, L. L. (2008). The meanings of branded products: A cross-national scale development and meaning assessment. Strizhakova, Y., Coulter, R. A., & Price, L. L. (2008). The meanings of branded products: A cross-International Journal of Research in Marketing, 82-93.

Teresa Barros, F. V. (2016). Corporate brand identity measurement – . International Journal of Innovation and Learning, 1-18.

Therkelsen , A., & Halkier, H. (2004). Umbrella Place Branding. A Study of Friendly Exoticism and Exotic Friendliness in Coordinated National Tourism and Investment Promotion. Denmark: SPIRIT.

Vanolo, A. (2010). The creative city imaginary1. In S. V. Haddock, Brand Building- The creative city (pp. 39-60). Italy: Firenze University Press.

Vivant, E. (2010). The (re)Making of Paris as a Bohemian Place? Progress in Planning, 107-152.

Wong, H. Y., & Merrilees, B. (2008). The performance benefits of being brand-orientated. Journal of Product & Brand Management, 372–383.

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Bridging the Threads: Challenges and Strategies for Handloom Retailers in Odisha's Online and Offline Markets

ABSTRACT

The handloom industry in India has witnessed steady growth over the past two decades, with Odisha emerging as a significant hub for local artisans and manufacturers. In today's era of conscious consumerism, handloom products are in demand both nationally and internationally; however, retailers continue to face critical challenges in sustaining and expanding sales across online, offline, and omni-channels (both online and offline). This study provides a comparative analysis of Odisha's handloom retailers, highlighting how offline sellers dominate due to cultural trust and tactile experiences, online retailers face barriers of competition and digital capability gaps, and omni retailers struggle with dual operational pressures. Drawing on primary data collected from 284 retailers through a structured survey, the findings reveal that while offline sales remain the most profitable, social media-driven commerce and omnichannel models present strong growth opportunities. The study offers targeted recommendations for strengthening trust, enhancing digital skills, optimizing store experiences, and leveraging government and NGO partnerships. Using the combination of tradition with modern retail strategies, Odisha's handloom sector can enhance its resilience, profitability, and global visibility in the years ahead.

Keywords: Sales Strategies, Online and Offline Markets, Handloom Product, Odisha

1. Introduction

The handloom industry is the second-largest in the world, proving how important textiles have been in Indian tradition since centuries. The textile industry supports a large number of weavers and artisans and provides them livelihoods like no other sector. It has played a major role in uplifting rural India. The Indian textile industry is now one of the leading economic sectors in the country. There have been tremendous developments in textile production technology, but none of them can replace handcrafted textiles. Artisans and weavers continue to work on their craft, but the issue arises when it comes to selling these products. There are a number of government schemes in place to support artisans, but not much has been done to support handloom retailers. Handloom retailers struggle to connect these artisans with customers. This study aims to address these issues by closely examining the struggles faced by handloom retailers in marketing products in both online and offline markets. This study also provides strategic solutions to alleviate these issues.

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1.1 Retail in Handloom Sector

Retailing in the handloom sector initially began with traditional offline stores. With the spread of technology, some retailers have started to use online platforms to reach customers far and wide. Most handloom retailers now use both online and offline channels to sell their products while some continue to rely solely on either online or offline markets. The retail market thus continues to evolve. E-commerce and digital platforms continue to grow rapidly. This has helped retailers reach more customers both within the country and abroad. Online marketplaces like Amazon and Flipkart have made it significantly easy for domestic and international buyers to access these products. In the present age, nothing changes the influence of social media, an important tool that helps retailers to increase their brand visibility. Initiatives such as the Handloom Mark scheme and Geographical Indication (GI) tags by Government of India, have further reinforced authenticity and market differentiation. Despite all these provisions, there are number of issues which these handloom retailers are facing for using various marketing channels effectively and efficiently. In this age of digitalization, offline retailers still faces issue in increasing the foot traffic of their stores. However, online retailers are facing the issue of digital illiteracy, logistical constraints, and stiff competition with other online marketplaces. Meanwhile, retailers with both channels have expressed their issue with maintaining a seamless and consistent brand presence across both physical and digital channels.

A number of studies have been conducted on the handloom sector of Odisha and most of which are focusing on aspects such as the historical and cultural significance, the socio-economic conditions of artisans and weavers, and its impact on economic livelihoods. However, there is a lack of research on the challenges faced by handloom retailers in selling their products through online, offline, and omnichannel (both online and offline) platforms. The growth of the handloom retail sector will depend on adopting innovative marketing strategies, utilizing digital tools effectively, and ensuring that retailers receive the necessary support to adapt to evolving consumer preferences. The primary objective of this study is to examine the challenges encountered by handloom retailers in Odisha in marketing and selling their products across different sales channels. Additionally, the study provides strategic marketing recommendations to help retailers enhance their market presence and overcome these challenges.

2. Literature review

This section of existing literature highlights the need for a comprehensive marketing strategy that integrates digital solutions, leverages e-commerce platforms, and addresses key consumer preferences.

2.1 Challenges in Marketing Handloom Product

Despite the growing demand for handloom products, retailers still face challenges in effectively marketing their products that emphasize the need for targeted marketing strategies that resonate with consumers, highlighting the complexities of promoting Indian handicrafts (Attri & Bairagi, 2022). Similarly, digitization plays a critical role in improving product visibility and promotion (Ghosal, Prasad, & Behera, 2020). The effectiveness of marketing strategies is further influenced by the integration of online and offline sales channels, with an omnichannel approach simplifying the consumer purchasing experience (Sharma & Reubens, 2024; Naik, Bhardwaj, & Mishra, 2024).

2.2 The Role of E-commerce in Expanding Market Reach

The integration of e-commerce has significantly impacted the handloom sector, particularly in regions such as Odisha (Tarai & Shailaja, 2020). Online platforms are a great way for artisans to reach out to customers, as they provide access to bigger markets and have the potential to improve sales (Yadav & Jena, 2022). Moreover, social media is a powerful marketing tool that has contributed to enhancing product visibility and engaging consumers (Guha, Mandal, & Kujur, 2021).

2.3 Changing Consumer Preferences and Market Expansion

Online shopping habits have changed, and research on Sambalpuri handloom products shows that digital buying is becoming increasingly popular (Maharana & Acharya, 2023). Both traditional and digital marketing strategies are providing many benefits to women craftsmen (Anurag & Kaur, n.d.). Additionally, initiatives such as using international platforms for market access and product displays might open doors for regional artisans (Ithurbide, 2023).

2.4 Strategies for Enhancing Online Sales and Market Sustainability

Improving quality in crucial areas such as training, promotional marketing, logistical assistance, and e-commerce solution training is necessary to increase online sales (Mohanty & Das, 2022; Banerjee & Bhattacharya, 2021). Long-term success in the handloom sector also depends on implementing sustainable business practices (Suresh, Saha, & James, 2024). One creative strategy for e-commerce promotion of local artisan goods is the Hub and Spoke model (Sharma, Bhowmick, & Patnaik, 2020).

2.5 Storytelling as a Marketing Tool

Showing genuine stories about workmanship, legacy, and sustainability can increase customer engagement and sales. Using storytelling in marketing tactics has been found to be an effective method in influencing consumer decisions to buy handcrafted products (Trivedi, Payal, Vasavada-Oza, & Krishna, 2023).

2.6 Digital Retail towards Handloom Products

The interplay between online and offline channels also presents unique challenges and opportunities for fostering customer loyalty and satisfaction, which are vital for sustained growth in the handloom sector (Yunita et al., 2024). The rapid advancements in digital technologies, such as artificial intelligence, machine learning, and the Internet of Things, further enable retailers to offer seamless and personalized shopping experiences across various touchpoints, thereby enhancing customer convenience and loyalty (Apryadhi et al., 2024; Vhatkar et al., 2024). This holistic integration of various retail channels provides customers with enhanced service, leading to increased sales and higher loyalty, as consumers can benefit from a unified shopping experience regardless of their chosen touchpoint (Yunita et al., 2024).

3. Research Methodology

Research Design

A descriptive research design was adopted to investigate channel-specific drivers and barriers. This study was conducted in Odisha and involved a sample of 284 handloom retailers. Convenience

sampling method has been used in conducting the study. A structured online questionnaire has been used to collect primary data. This questionnaire consists of 17 multiple choice questions. The following retailers have been approached for participation in the study:

1. *Online Retailers* – Retailers who exclusively sell their products through online platforms.
2. *Offline Retailers* – Retailers who operate solely through physical stores.
3. *Omnichannel Retailers* – Retailers utilizing both online and offline platforms for sales.

Sampling Technique and Sample Size

Sample of 284 Odisha-based handloom retailers was selected using convenience sampling.

Inclusion Criteria:

- Retailers selling Odisha handloom products through online, offline, or both channels.
- Willingness to participate and provide complete responses through a structured questionnaire.

Exclusion Criteria:

- Handloom retailers outside Odisha.
- Retailers not involved in selling Odisha-specific handloom products.

Tools and Methods of Data Collection

Primary Data

Primary data was collected using questionnaires that captured 20 questions on retailer demographics, business experience, channel usage, profitability perceptions, customer engagement patterns, drivers for channel selection, and barriers faced in online/offline operations. A pilot study was conducted prior to final data collection to test clarity, relevance, and internal consistency of the questions and statements. Necessary modifications were incorporated based on the received responses.

Secondary Data

Secondary data were sourced from:

- Academic books and peer-reviewed journals
- Government reports and policy documents related to handlooms
- Market studies, industry reports, and e-journals focusing on Indian and Odisha handloom sectors
- E-resources on online/offline retailing and e-commerce in handloom sectors.

Data Analysis Techniques

The collected data were coded and analyzed using percentage distribution and frequency analysis to compare channel-specific trends. Graphical interpretation was used to illustrate channel prevalence, digital adoption, cost structures, customer interactions, and profitability variations among retailer groups.

Ethical Considerations

- Participation in the survey was voluntary.
- Respondent anonymity and confidentiality were maintained.
- Data were used strictly for academic research purposes.

4. Results and Discussions

This study provides a comparative analysis of the challenges faced by handloom retailers operating through different sales channels- online, offline, and omnichannel (both online and offline). The study highlights challenges encountered by each category such as key operational, logistical, and market-related difficulties that impact sales performance. The comparative analysis in this study not only identifies these challenges but also provides insights into how different retail strategies impact sales efficiency, market reach, and overall business sustainability. The findings help in understanding the challenges and in developing targeted interventions and strategic solutions to enhance the resilience and profitability of handloom retailing in Odisha.

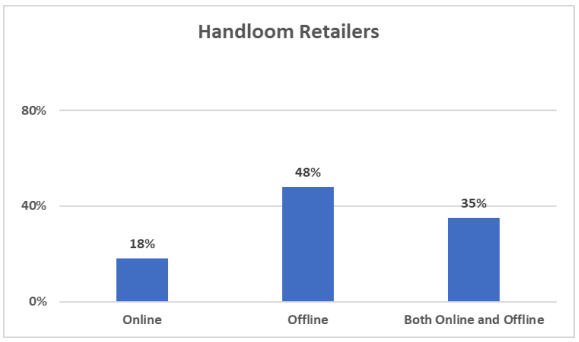

Fig 1. Handloom Retailers

The chart shows the distribution of handloom retailers by selling mode: offline-only retailers dominate with 48%**,** followed by omni sellers at 35%, while online-only retailers make up just 18%. This indicates that traditional offline retailing continues to be the strongest channel for handloom sales, supported by established practices and customer trust. However, the growing share of omni retailers reflects a visible shift toward integrating digital platforms. Despite this trend, digital penetration remains relatively limited compared to offline dominance.

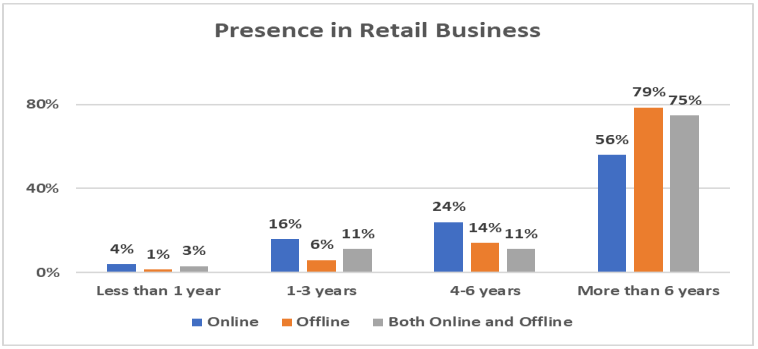

Fig 2. Presence in Retail Business

The chart highlights the duration of business presence among handloom retailers across online-only, offline-only, and omni (both) channels. Offline retailers are the most mature, with 79% operating for over six years and very few recent entrants, reflecting long-established businesses. Omni retailers also show maturity, with 75% in operation for more than six years, though a small 11% fall in the 1–3 year bracket, suggesting experimentation with blended models. Online-only sellers are comparatively

younger, with 56% over six years old but a notable 20% being new (under three years). This shows online platforms are attracting newer entrants.

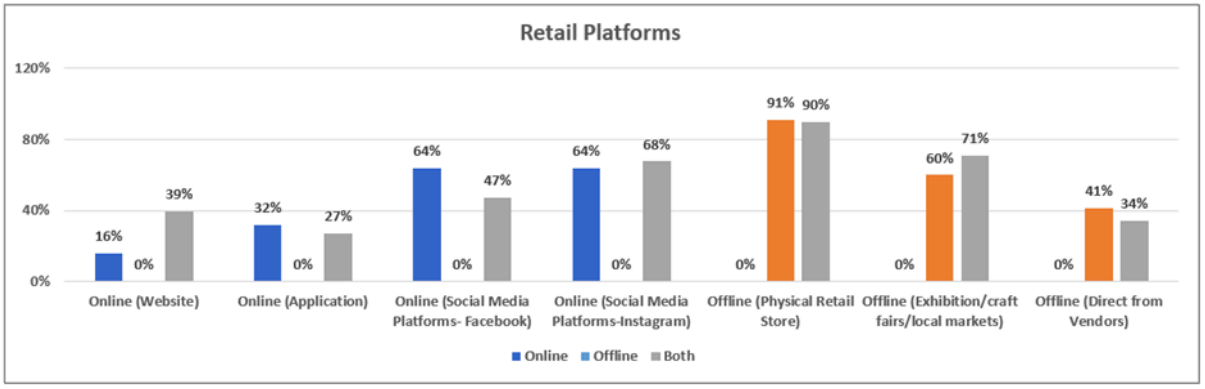

Fig 3. Retail Platform Usage

The chart shows the platforms used by handloom retailers across online-only, offline-only, and omni modes. Offline stores dominate**,** with 91% relying on them, reaffirming the centrality of traditional retail. Among online channels, Facebook (68%) and Instagram (64%) are the most popular, making social media the primary driver of online presence. In contrast, websites (32–39%) and dedicated apps (16%) remain underutilized, highlighting limited investment in owned digital platforms. Omni retailers balance physical stores with social media but still show weaker adoption of apps and websites. Overall, offline remains strong, while online growth depends heavily on social media visibility.

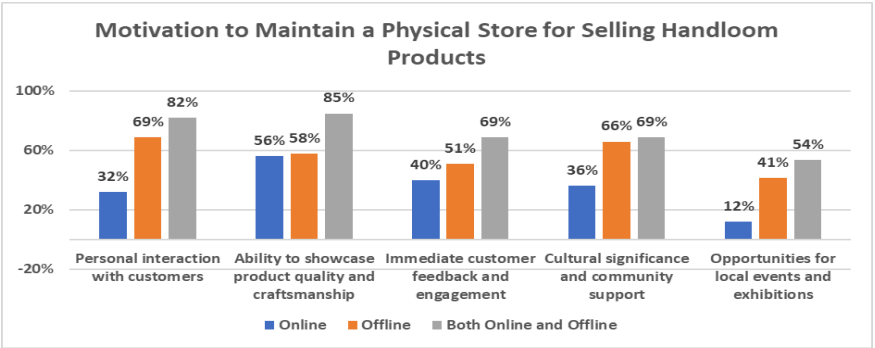

Fig 4. Motivations for Maintaining a Physical Store

The chart highlights why retailers still value physical stores in the digital era. The strongest drivers are the ability to showcase product quality and craftsmanship (58–85%), enable personal interaction with customers (69–82%)**,** and uphold cultural significance and community support (66–69%)**.** Omni sellers show the highest motivation across all factors, reflecting the need for credibility, trust, and deeper engagement even with digital operations. Physical stores also support immediate feedback (51–69%) and opportunities for local events and exhibitions (41–54%)**,** keeping businesses rooted in community. Overall, sensory experience and cultural heritage remain advantages offline platforms uniquely provide.

Fig 5. Importance of Shopping Environment

The chart highlights how retailers view the importance of the physical shopping environment in driving sales. A large majority of offline (84%) and omni retailers (90%) emphasize store layout, ambiance, and overall environment as highly important, showing their reliance on experiential factors for customer engagement. In contrast, only 40% of online retailers consider it very important, while 56% see it as somewhat important, reflecting their limited dependence on physical spaces. Very few across all categories dismiss it as unimportant (4% online, 1% offline). Overall, offline success depends heavily on creating strong in-store experiences that build trust and drive purchases.

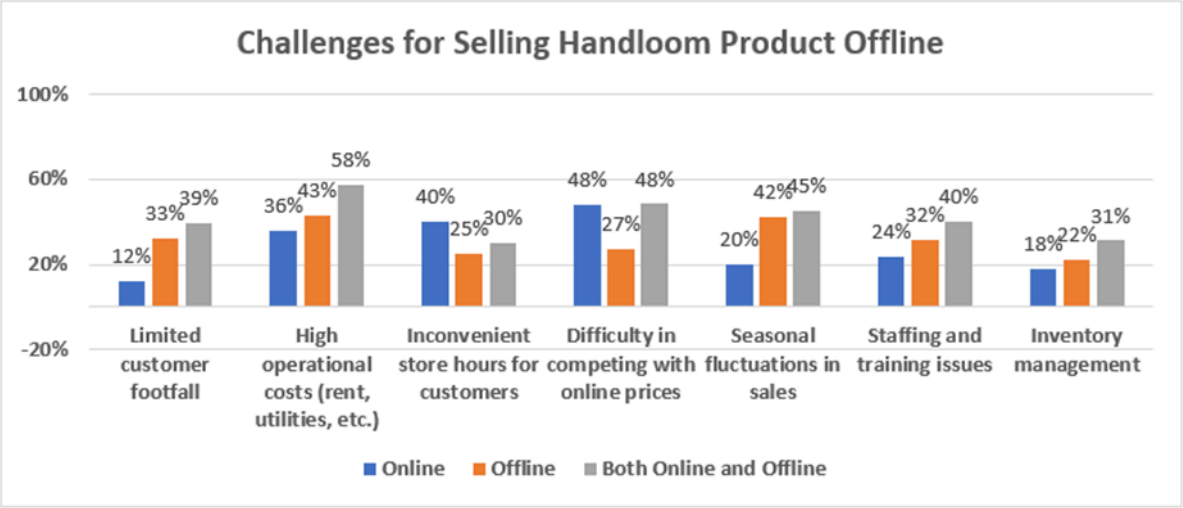

Fig 6. Challenges for Selling Handloom Product Offline

The chart highlights key hurdles for retailers maintaining physical stores. High operational costs (rent, utilities, maintenance) are the biggest concern, especially for omni sellers (60%) who must sustain both physical and digital channels. Price competition with e-commerce is another major issue, reported by 40% of online and around 50% of blended sellers, reflecting the difficulty of matching online discounts. Other challenges include low customer footfall, seasonal sales fluctuations, staffing gaps, and inventory management, though their intensity varies. Overall, omni retailers face the greatest cost burden, while offline sellers rely on customer experience, and online sellers battle price pressures.

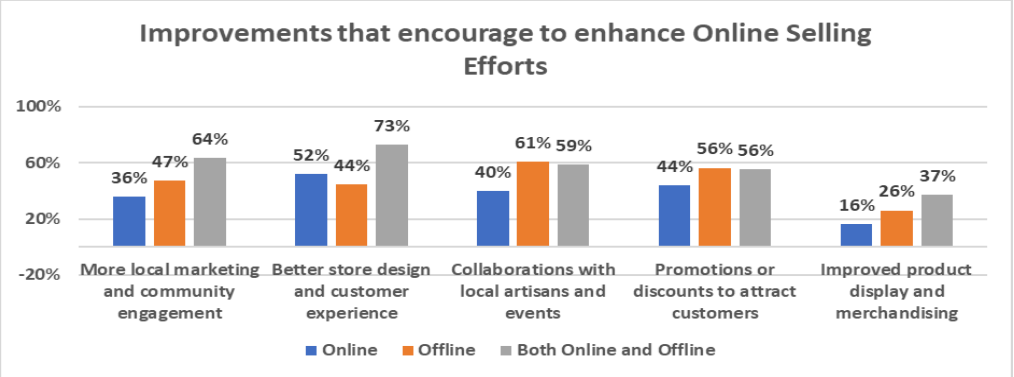

Fig 7. Improvements Encouraging Online Sales

The chart highlights strategies retailers see as key to strengthening digital presence. Better store design and customer experience ranks highest (73% omni, 52% online), showing that presentation, storytelling, and authenticity build credibility. Local marketing and community engagement (47–64%) are also vital, reinforcing trust and cultural connection. Collaborations with artisans and events are valued by offline (61%) and omni (59%) sellers for their role in cultural relevance and differentiation. While promotions/discounts (44–56%) help, they rank below experiential factors. Product display improvements (16–37%) matter less. Overall, success in digital channels depends on authenticity, cultural linkage, and community-driven storytelling.

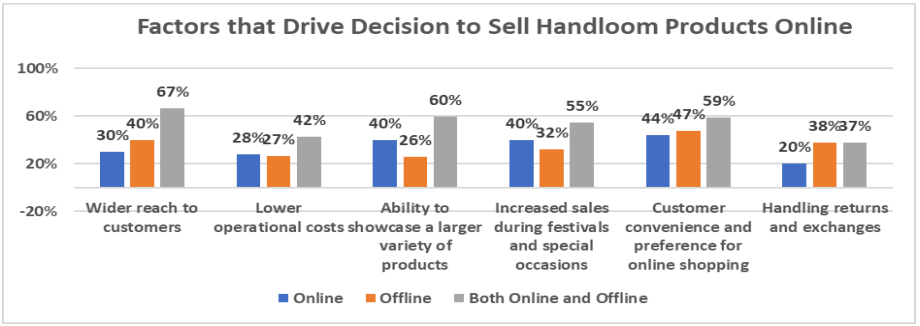

Fig 8. Top Drivers to Sell Online

The chart highlights key motivations for retailers to adopt digital sales. The strongest drivers are wider reach (67% of blended sellers), the ability to showcase larger product variety (60% blended, 40% online), and festival-driven sales boosts (40–55%). Customer convenience is also critical, cited by 59% of blended and 44–47% of others, reflecting demand for accessibility. Lower operational costs (27–42%) and easier handling of returns/exchanges (37–38%) matter but are less central. Overall, omni sellers value digital channels most, seeing them as vital for scaling, reaching broader markets, and leveraging seasonal peaks—crucial for Odisha handlooms to expand beyond local boundaries.

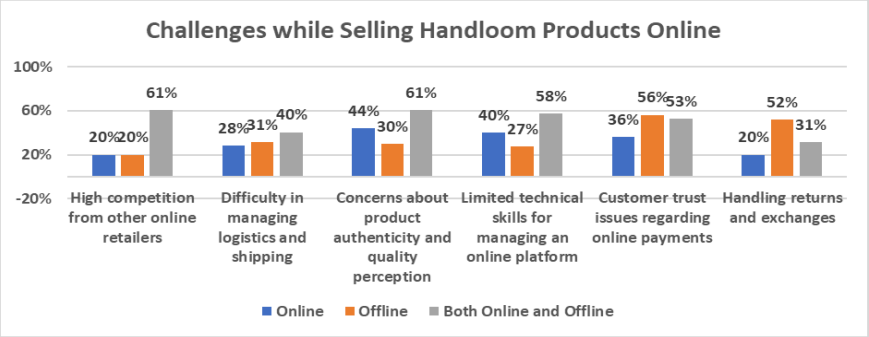

Fig 9. Key Challenges in Online Sales

The chart outlines key difficulties retailers face in digital channels. The biggest challenges include intense competition (61% of blended sellers), limited technical skills (58%), and concerns over authenticity and quality (44–61%) critical in handlooms where trust matters. Other issues are customer payment trust (53–56%), logistics and shipping hurdles (28–31%), and the complexity of returns/exchanges (31–52%). Omni sellers face the toughest situation, as they must balance both offline and online formats, increasing costs and operational strain. Overall, digital sales growth is constrained by capability gaps, trust deficits, and infrastructure weaknesses, requiring targeted solutions for sustainable expansion.

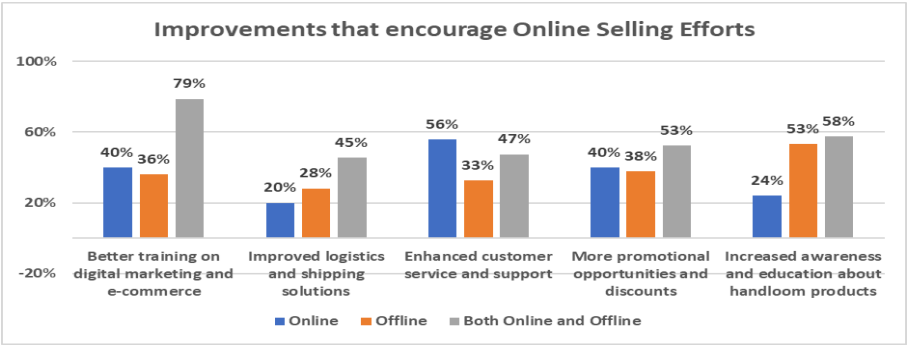

Fig 10. Encouraging Improvements for Online Selling

The chart highlights opportunities for strengthening digital sales. Omni sellers show the highest demand, with 79% seeking training in digital marketing and e-commerce, 58% calling for greater awareness of handloom products, and 45% emphasizing better logistics. Online-only retailers prioritize enhanced customer service (56%) and promotional opportunities (53%) to boost growth. Offline sellers are less vocal but still value awareness-building (53%) and stronger support and promotions. Overall, sellers agree that capacity-building in digital skills, e-commerce management, marketing, and logistics alongside initiatives to raise product awareness are crucial to reducing risks and enabling sustainable online expansion in the handloom sector.

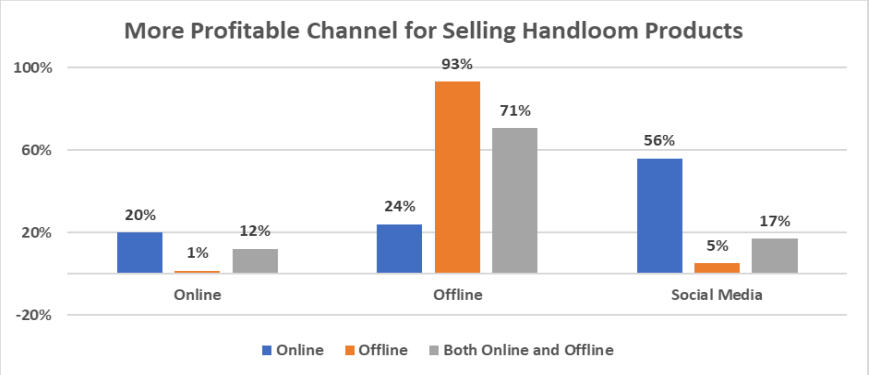

Fig 11. Profitability Perception

The chart compares profitability across channels for different seller types. Offline clearly dominates, with 93% of offline-only and 71% of omni retailers considering it their most profitable channel, confirming physical markets as the strongest driver of profits in handloom sales. For online-only sellers, however, social media stands out, with 56% citing it as their most profitable channel, compared to just 5% of offline and 17% of omni sellers. By contrast, traditional online platforms lag, with only 20% of online sellers, 12% of omni, and 1% of offline sellers reporting profitability, showing weaker returns than offline or social-driven sales.

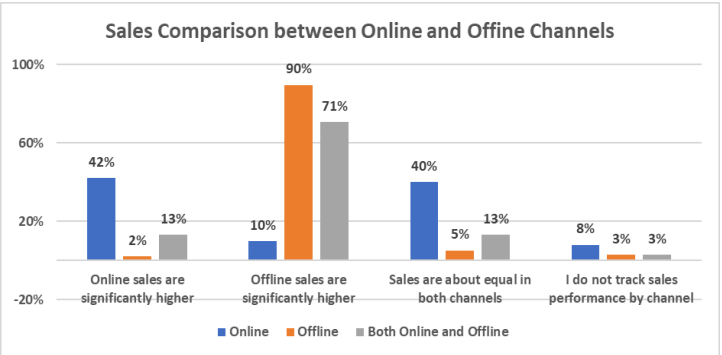

Fig 12. Sales Volume Trends

The chart highlights seller views on sales strength across channels. Offline dominates, with 90% of offline-only and 71% of omni sellers reporting higher offline sales, underscoring the continued power of physical markets. Online-only retailers see stronger digital performance, with 42% citing higher online sales and 40% noting parity, showing that channel-native sellers perform best in their chosen format. For omni sellers, offline still leads, though 13% report sales parity. Overall, offline remains the primary driver, while parity between channels is emerging in some cases. A small share (3–8%) across groups do not track sales performance systematically.

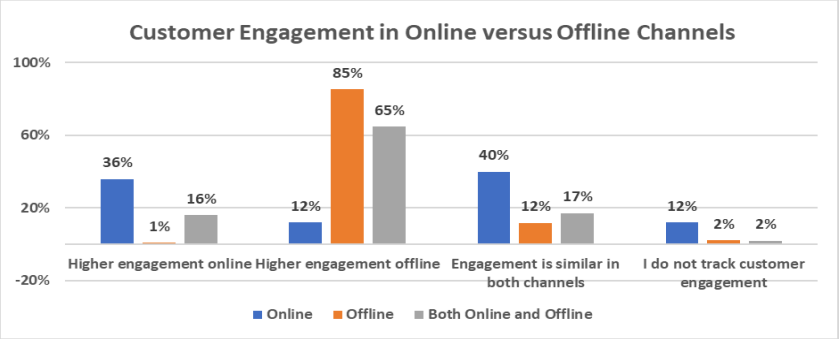

Fig 13. Customer Engagement

The chart compares seller perceptions of customer engagement across channels. Offline dominates, with 85% of offline-only and 65% of omni sellers reporting stronger engagement through face-to-face trust and personal interaction—crucial in handloom sales. Online sellers see some strength digitally, with 36% citing higher online engagement, though barriers like limited trust and lack of personal touch remain. A balanced view exists too: 40% of online and 17% of omni sellers find engagement similar across channels, suggesting potential for omnichannel strategies. However, 2–12% of sellers across groups do not track engagement, risking weaker optimization of customer relationships and growth.

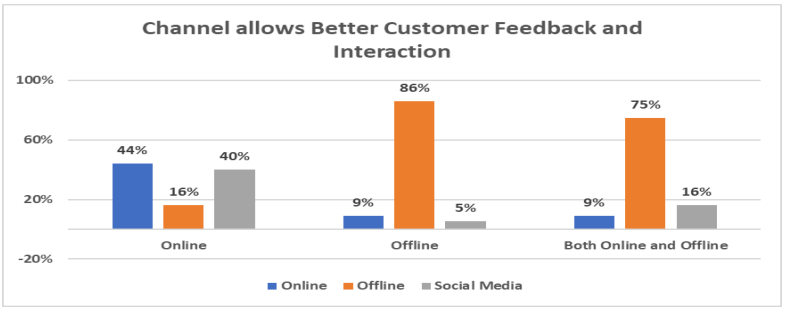

Fig 14. Customer Feedback Quality

The chart shows seller views on customer interaction and feedback across channels. Offline dominates, with 86% of offline-only and 75% of omni sellers favoring it for stronger trust, personal conversations, and service. For online sellers, social media emerges as the best feedback tool (40%), far ahead of e-commerce sites (16%), highlighting the importance of direct engagement over impersonal marketplaces. Still, only 44% of online sellers find e-commerce effective for feedback, revealing trust gaps and weaker interaction. To bridge this, digital sellers need to strengthen trust through reviews, live demos, and video consultations, replicating offline's personal connection digitally.

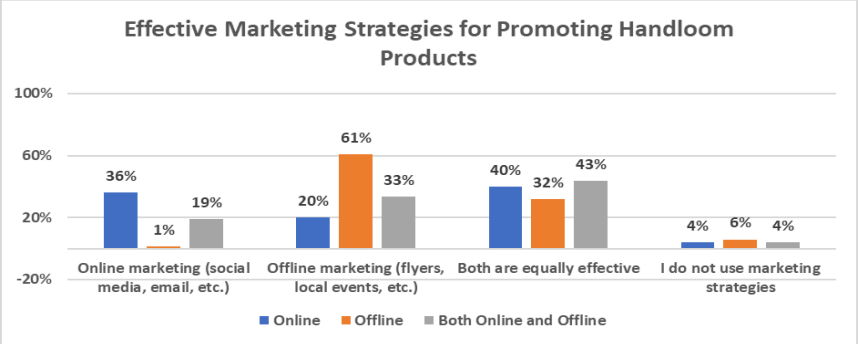

Fig 15. Marketing Effectiveness

The chart compares seller views on marketing effectiveness across channels. Offline marketing remains strong, with 61% of offline sellers and 33% of omni favouring strategies like local events, exhibitions, and flyers, reflecting the value of community-driven outreach for handloom. Online sellers lean on digital marketing, with 36% prioritizing tools like social media and email, while just 1% of offline sellers agree. Balanced strategies are increasingly popular 40% of online and 43% of omni sellers see both online and offline as equally effective, showing the rise of omnichannel approaches. Very few sellers (4–6%) report not using marketing at all.

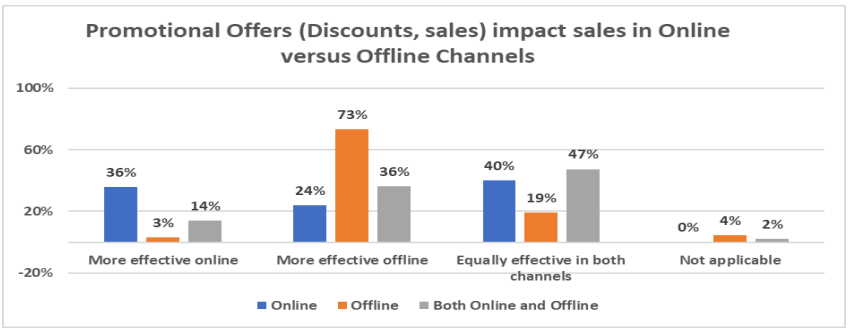

Fig 16. Promotions

The chart reveals differing perceptions of promotion effectiveness across retail channels. Offline dominates, with 73% of offline-only sellers and 36% of omni sellers finding promotions more effective in physical spaces, where urgency and trust drive quick conversions. Online retailers are more divided: 36% favour online promotions, while 40% see them equally effective across channels, reflecting reliance on digital campaigns but also limits in replicating offline urgency. Omni sellers are split, with 47% believing promotions work equally well across both. Overall, offline promotions excel in urgency and personal trust, while online requires stronger targeting, personalization, and trust-building to match.

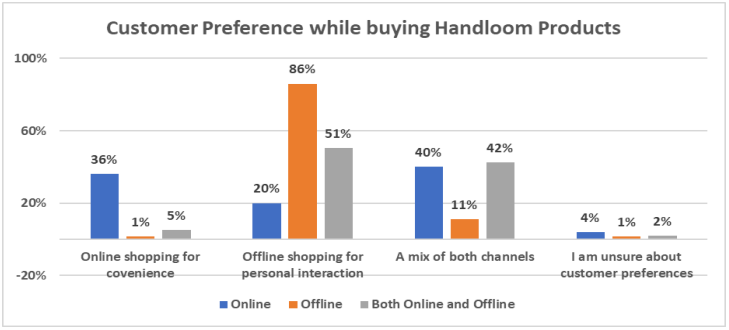

Fig 17. Customer Preferences

The chart highlights customer buying preferences across channels. Offline dominates, with 86% of offline-only and 51% of omni sellers noting strong preference for in-person shopping, driven by trust, touch, and personal interaction—key for handloom products. Online preference is lower, with only 36% of online sellers citing convenience as the main driver, showing that ease alone cannot replace tactile validation. A balanced preference is emerging: 40% of online and 42% of omni sellers report customers value both physical interaction and digital convenience. The main barrier for online remains the lack of touch-and-feel, reinforcing offline's continued dominance despite digital expansion.

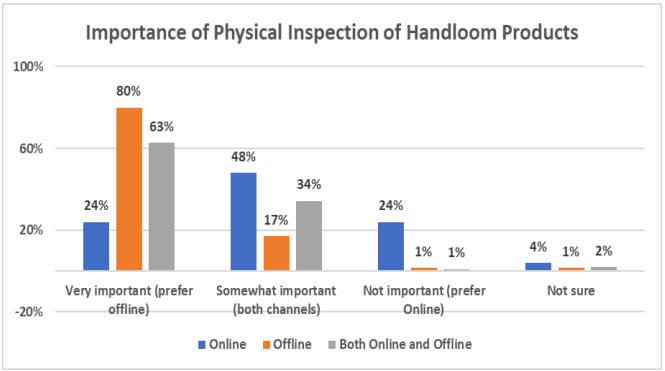

Fig 18. Importance of Physical Inspection of Handloom Products

The chart shows differing views on the importance of physical inspection in handloom sales. Offline (80%) and omni sellers (63%) see it as very important, stressing the role of touch-and-feel in assessing craftsmanship and authenticity. Online sellers are split: only 24% consider it very important, while another 24% dismiss it, relying instead on digital tools like photos, reviews, and descriptions. Many online (48%) and omni sellers (34%) see it as "somewhat important," reflecting a middle ground. Overall, the lack of tactile experience is a key barrier online, requiring AR/VR previews, videos, or flexible return policies to build trust.

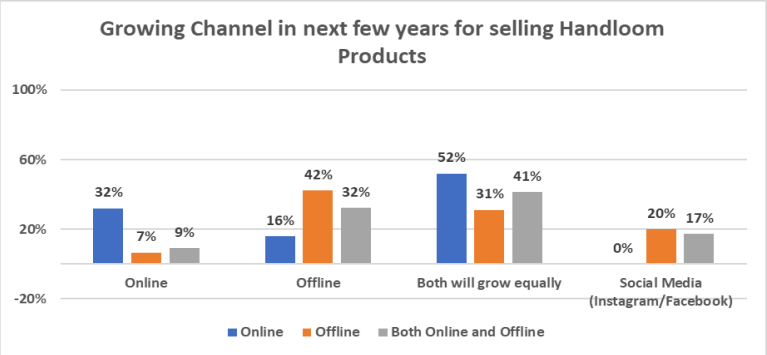

Fig 19. Future Growth Expectations

The chart shows seller expectations for future sales channels across online-only, offline-only, and omni retailers. Growth is expected to be multi-channel, with 52% of online and 41% of omni sellers predicting equal expansion of both formats. Offline sellers remain optimistic about physical growth (42%), reflecting confidence in trust, touch, and local networks. Online potential is strongest among online-only sellers (32%), though overall it is seen more as a complement than the main driver. Social media emerges as a new growth lever, with 20% of offline and 17% of omni citing its rising influence in sales.

Comparative Analysis of handloom retailers across different sales channels

Handloom retail in Odisha operates across three models offline, online-only, and omni with distinct dynamics. Offline retailers dominate (48%) and are the most mature, with nearly 80% in business for over six years. Their strength lies in trust, cultural roots, and tactile experiences, though they face high operational costs, seasonal dependence, and pricing competition. Omni retailers (35%) are equally mature but struggle with heavy dual costs and lack of synergy between channels. Online-only sellers (18%) are the smallest yet fastest-growing, led by younger entrants exploring digital-first models, though they remain vulnerable due to low trust, technical skill gaps, and logistics challenges.

Comparatively, offline remains most profitable and preferred, with 93% of offline and 71% of omni sellers finding it more lucrative than digital. Customers strongly favour offline engagement, while online depends heavily on social media to drive visibility and sales. Bottlenecks differ: offline suffers from high costs, online from lack of authenticity, and omni from managing dual complexities. To grow, online sellers must build trust via visuals, storytelling, and digital marketing. Offline sellers should reduce costs and enhance experiential stores. Omni must create synergy, streamline inventory, and balance offline credibility with online reach.

5. Conclusion

The survey reveals that handloom retailing in Odisha continues to be anchored in offline channels, driven by deep-rooted cultural trust, tactile experience, and community engagement. While online and omni models are gaining traction, particularly through social media, they remain constrained by operational challenges such as digital capability gaps, customer trust issues, and high competition. Omni retailers, though potentially well-positioned, face the dual burden of sustaining physical overheads while investing in digital visibility. To strengthen the sector, differentiated strategies are essential: offline retailers must focus on optimizing costs and enhancing in-store cultural experiences,

online retailers need to build authenticity and expand digital skills to scale beyond Odisha, and omni retailers must strive for synergy rather than duplication across channels. Looking forward, the most promising pathway is *omnichannel growth*, where the strengths of offline credibility and online reach are combined to deliver sustainable profitability. Targeted interventions—capacity building in e-commerce, logistics support, cooperative models for cost reduction, and integration with tourism and cultural promotion—can further enhance the resilience of Odisha's handloom sector. Ultimately, by blending tradition with innovation, handloom retailers can secure not just local relevance but also national and global visibility, ensuring both cultural preservation and commercial viability in the years ahead.

Recommendations

Odisha's handloom sector has significant scope for growth if it embraces emerging opportunities. Retailers should prepare for an omnichannel future, as most sellers expect multi-channel models to drive expansion rather than relying on a single format. Social media commerce is set to play a central role, especially for online-only sellers, where platforms like Instagram and Facebook already generate higher profitability than traditional e-commerce sites. At the same time, tourism integration offers offline retailers a powerful advantage by linking handloom stores with heritage circuits in Konark, Puri, and Bhubaneswar, they can attract both cultural and commercial footfall. Finally, government and NGO partnerships in areas such as digital training, logistics hubs, and collaborative marketing can strengthen retailer resilience and amplify Odisha's handloom identity on both national and global platforms.

References

Apryadhi, F., Mohamad, N., Nizam, N. Z., & Othman, A. B. (2024). Exploring the moderated mediation model of customer intention in omnichannel technology: a systematic literature review. *International Journal of Research in Business and Social Science (2147-4478)*, *13*(4), 25. https://doi.org/10.20525/ijrbs.v13i4.3408

Attri, R., & Bairagi, R. (2022). Guthali–Challenges in marketing Indian handicrafts and handloom. *Emerald Emerging Markets Case Studies, 12*(1), 1–23.

Ghosal, I., Prasad, B., & Behera, M. P. (2020). Delineating the exchange environment of handicraft industry from market space to marketplace: An inclusive map for RURBAN development. *Paradigm, 24*(2), 133–148.

Sharma, S., & Reubens, R. (2024). Craft retail: Omnichannel. In *The Routledge handbook of craft and sustainability in India* (pp. 213–227).

Naik, M. K. P., Bhardwaj, P., & Mishra, V. (2024). Modeling of barrier in the adoption of omnichannel marketing: A case of Indian handloom industry. *Research Journal of Textile and Apparel, 28*(4), 857–878.

Tarai, S. K., & Shailaja, K. (2020). Integration of e-commerce in handloom sector: Consumer perspective in Odisha, India. *Journal of Textile & Apparel Technology & Management, 11*(4).

Yadav, S. B., & Jena, B. B. (2022). The interplay between handloom e-commerce platform and handloom weavers: A case study approach. *IUP Journal of Business Strategy, 19*(1), 48–66.

Guha, S., Mandal, A., & Kujur, F. (2021). The social media marketing strategies and its implementation in promoting handicrafts products: A study with special reference to Eastern India. *Journal of Research in Marketing and Entrepreneurship, 23*(2), 339–364.

Maharana, K. C., & Acharya, S. C. (2023). Customer's attitude towards online shopping of Sambalpuri handloom: A study on Sambalpur District. *SSRN*.

Anurag, U., & Kaur, S. (n.d.). Blended traditional and digital marketing for empowering women artisans: An empirical approach. In *Women in education and work life* (p. 59).

Ithurbide, C. (2023). Global platforms weaving into the craft industry: Lessons from localisation strategies in India. In *Digital platforms and the Global South* (pp. 91–108). Routledge.

Mohanty, S. K., & Das, R. C. (2022). Service experience and customer satisfaction in offline and online services: A study on traditional apparel retail in Odisha. *Orissa Journal of Commerce, 42*(4), 74–91.

Banerjee, N., & Bhattacharya, S. C. (2021). E-commerce–Stitching the gap between weavers and consumers. In *Interdisciplinary research in technology and management* (pp. 121–127). CRC Press.

Suresh, R., Saha, P., & James, J. (2024). Handloom and resource equity—A circularity narrative from India in the Global South. *Journal of Cleaner Production, 468*, 143081.

Sharma, A., Bhowmick, B., & Patnaik, J. (2020). Innovation through hub and spoke model: E-commercializing regional India's handicraft industry. In *European Conference on Innovation and Entrepreneurship* (pp. 614–XXI). Academic Conferences International Limited.

Trivedi, M., Payal, M., Vasavada-Oza, F., & Krishna, R. (2023). Tell me a story! Antecedents to purchase of handloom products in India. *Global Business Review, 24*(4), 704–720

Vhatkar, M. S., Raut, R. D., Gokhale, R., Kumar, M., Akarte, M., & Ghoshal, S. (2024). Leveraging digital technology in retailing business: Unboxing synergy between omnichannel retail adoption and sustainable retail performance. *Journal of Retailing and Consumer Services*, *81*, 104047. https://doi.org/10.1016/j.jretconser.2024.104047

Yunita, D., Adam, M., Wahab, Z., Andriana, I., & Nailis, W. (2024). Omni-Channel Strategy in the Digital Retail Environment. In *Business, management and economics*. https://doi.org/10.5772/intechopen.1005112

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Vav ni Dharohar: An Interactive Mobile App with AR Experience of UNESCO World Heritage Site "Rani-ki-Vav"

ABSTRACT

Digital technology and artificial intelligence are powerful tools for documenting and modeling historic architecture. Yet there remains a substantial need to present information about symbolism, construction, and purpose in accessible, standardized, and engaging forms, especially on-site. This paper presents the design and development of a mobile application that leverages Augmented Reality (AR) to enable visitors to scan sculptures at the UNESCO World Heritage Site, Rani-ki-Vav, and receive detailed breakdowns of iconography, construction techniques, and cultural symbolism. We adapted the original kiosk-based system to enable portable, personalized engagement via smartphone, retaining all research stakeholders, methodology, and content strategies. Human-centered design guided app development, and extensive stakeholder engagement ensured cultural and linguistic inclusivity. This approach demonstrates how AR mobile technology enhances heritage interpretation, accessibility, and visitor satisfaction.

Keywords - Augmented Reality, Interaction Design, historical monument, Rani-ki-Vav, UX Research, Human-Centred Design, UNESCO World Heritage Site.

1. Introduction

A stepwell serves the community by acting as a shared social space as well as a functional water source, it is intentionally designed as cool retreats where people could rest, interact, and carry out daily activities around the well (Mungona & Thakre, 2025). Stepwells can also be found next to main roadways, inside a village, or on its outskirts. They are located approximately at distances that a caravan could march in a day, making them the perfect spots to stop throughout the lengthy voyage. The majority of them have been discovered along the ancient trade routes that connect the coastal towns of Gujarat to the great capitals of northern India. The protracted lean season in Gujarat's arid climate results in very little water in the rivers and lakes. These subterranean wells were once the primary source of water for the home and for the farm (Neubauer, 1999).

The "Rani-ki-Vav" or Queen's Stepwell in Patan, Gujarat, is an intact stepwell that was commissioned and built during the Chaulukya or Solanki dynasty in the eleventh century CE. The region was formerly known as Anhilwara Patan, the Chalukya capital. The Chaulukya period, also known as the Golden period in Gujarati history, saw the construction of many public welfare projects, such as stepwells, ponds, lakes, vidyapeeth (ancient universities), chhatravas (dormitories), temples, and other similar establishments that enhanced society and culture (Prajapati & Kava, 2022).

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The designation of a location as a World Heritage Site by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) brings international recognition and respect. This certification serves as a permanent instrument for promoting the place, adding value to tourists, and ensuring the standard quality of cultural experiences (Marcotte & Bourdeau, 2006). Museums at heritage sites conserve, guard, and shape a significant portion of our cultural history. Museums are increasingly being viewed as leisure centers, emphasizing the importance of user experience and interaction. The museum sector focuses on audience research, marketing, and consumer profiling. The 'primacy of the guest' phenomenon has led museums to prioritize visitors while developing new strategies (Løvlie, et al., 2022).

According to visitor studies, technology can be used successfully in a personal tour of museum programs because visitors are willing to try new gadgets to learn about exhibitions. Furthermore, as the use of handheld devices increases, so does the comfort of users with digital technology. A museum visit should be looked back upon as a good memory of a pleasurable learning experience, not as a bad memory of a battle with a troublesome gadget (Lydens, Saito, & Inoue, 2007). Studies also demonstrate that museum visitors prefer technologies that allow them to access information on demand, navigate exhibits easily, and engage with content at their own pace, which helps build comfort and eliminates barriers to learning (Rhee, Pianzola , & Seo, 2025).

While perceptions about archaeology and cultural heritage are typically developed at a young age through exposure to mass media and official and informal education, the quality of these exposures varies greatly and frequently fails to engage young people in meaningful ways. Although digital tools may appear to be an appealing means of intervening in this meaning-making process, their application to archaeological pedagogy in primary and secondary schools is limited. Using historical empathy and the Arc of Dialogue as guides, we created a digital resource for archaeology that emphasises collective, embodied, and affective learning. This resource includes 3D prints, a chatbot, webpages, and virtual walkthroughs (McKinney, Perry, Katifori, & Kourtis, 2020). Adaptive resources, such as virtual worlds or games, require continual input from the user, and because of their nature, they are becoming more frequent as archaeogaming and VR/AR technology gain traction. Finally, communicative resources include tasks that rely on interaction between individuals and groups, such as social media or texting. Archaeological sites and museums often use social media to share digital educational resources with the public (McKinney, Perry, Katifori, & Kourtis, 2020).cl

Adapting AR in cultural heritage organisations needs more than just having the appropriate gear or software. It also depends on the readiness of both museums and their audiences to participate in new experiences. Satisfaction of visitor with AR in heritage museums is mainly driven by the novelty of the technology, their trust in it, and how well the AR experience delivers aesthetics, education, and authenticity, which in turn strongly increases both their intention to keep using AR and to revisit the

destination. The intentions of tourists to use AR in a cultural heritage museum are strongly shaped by how useful and easy to use they perceive the AR to be, as well as by personality traits such as innovativeness, discomfort, and concerns about security, which together influence their attitudes and their willingness to revisit the destination (Xu W. , Ismail, Shahruddin, Quan, & Li, 2025). Museums are urged to prioritise human-centred design, strong privacy safeguards, and adjust AR material for a range of audiences while taking cultural variances and practical difficulties into account in order to maintain audience engagement (Xu W. , Ismail, Shahruddin, Quan, & Li, 2025).

1.1 Literature Review

A stepped-well is an underground well with steps that lead to the water level. Step-wells were generally excavated near rivers. Creating reservoirs, lakes, wells, and other watering sites was considered a noble act in India, especially to honour the dead, leading to the excavation of several stepped-wells in Gujarat and Rajasthan over centuries. Subterranean structures with exquisite interiors stand out amid the Western desolate landscape of India. The stepped-well of India is a unique contribution to the architectural heritage of the world (Mankodi, 2012). The semi-arid climate of Gujarat necessitated the construction of stepwells to suit drinking water requirements. They provided a comfortable space for women to gather and, in some cases, were used for worship. These step wells are also known for their intricate sculptures and carvings (Amirthalingam, 2015).

Rani-ki-Vav (23° 51'N; 72° 11'E) is located 2 km northwest of the old town of Patan. Rani-ki-Vav faces east and has a well-built stepped-well. Among the step-wells, Rani-ki-Vav is the most magnificent, not only in Gujarat but throughout the entire country (Mankodi, 2012). Book of Merutuṅga "Prabandha Cintamani", written in the 14th century, states: During the reign of King Bhimadeva I, Queen Udayamati planned to build a stepwell (Sadani, 1998).

It is a stunning example of the Jal Dharohar, which makes India one of the only countries in the world with such intricate yet publicly accessible water supply systems (Prajapati & Kava, 2022). UNESCO selects World Heritage Sites based on their historical, cultural, natural, or other significance and their importance to humanity. As of July 2018, UNESCO has listed Rani-ki-Vav as a World Heritage Site along with 1092 other monuments (Riley, 2018).

Heritage sites and museums are no longer solely about displaying things in isolation. They are adopting new technology to engage visitors through various modalities, promoting discovery, comprehension, and personalised learning. Since the mid-1990s, interactive devices (ID) have been utilised in museum exhibitions to provide visitors with graphic and contextualised information, facilitating multi-generational learning. Interactive devices, such as digital kiosks, provide powerful learning experiences in museum galleries (Harvey, 2014).

Museums/Exhibitions use various technologies, such as interactive information panels, audio/multimedia guides, installations, and VR headgear. According to Hornecker and Ciolfi, technology in museums can be categorized into three types of interactions: standalone installations, mobile interactions, and 'assemblies' that combine digital technology across several displays. Stand-alone installations emphasize technology above the actual collection. A common example is the digital information kiosk. Adding digital content to the physical display via a visitor-portable device is a popular approach to incorporating technology into museums. Virtual Reality, Augmented Reality, Artificial intelligence are technological trends that go through cycles of hype and bust, and in practice, it is often more complicated to apply new technologies into real-world settings than the hype suggests. This is also the case in the museum domain, where the promises and challenges of digital technologies have permeated the field for decades (Løvlie, et al., 2022).

Digital knowledge solutions that make the assumption that everyone approaches information in the same way and with the same skills run the danger of leaving out a significant portion of the population. Actually, by keeping people from using digital resources at all, these applications work to disable them. Our knowledge of how individuals use digital resources has to be expanded (Williams, 2012).

In museum settings, AR has been shown to significantly improve educational opportunities, stimulate the curiosity of visitor, and boost their level of engagement. By superimposing digital material on actual objects, these technologies give displays life and create multimodal learning environments. When combined with devices that are easy to use and comfortable, the richness and depth of augmented reality material optimise learning outcomes and psychological immersion. Efficient design and ergonomic equipment are essential for maintaining the comfort and interest of guests. The Information Systems Success Model is one theoretical framework that links these benefits to careful hardware design and content strategy. Researchers recommend expanding creative uses of AR across museum exhibits, always refining the user experience and keeping cultural contexts in mind to achieve optimal educational impact (Chen & Lai , 2021).

Museum practice is being further revolutionised by extended reality (XR) technologies. This includes AR, virtual reality, and mixed reality, which together offer interactive, customised, and engaging experiences. XR is shown to deepen visitor satisfaction, enhance learning, and encourage more meaningful connections with cultural heritage, especially among younger audiences. Museums are experimenting with gamified exhibits, virtual field trips, and immersive narrative forms to open up new ways of inquiry and interaction. Despite these improvements, institutions nevertheless have to deal with technological difficulties, investment costs, and legitimacy issues. Museums are setting the standard for visitor-centred strategies that benefit the whole museum industry as they embrace XR and develop into dynamic venues for intercultural communication, personal discovery, and creative educational programs (Avlonitou & Papadaki, 2025).

2. The Proposed Method

The project was also an exercise in combining secondary literature review with primary ethnographic research.

The timeboxing four-phase model: A development model for interactive installations consisting of four phases, each with a set of deliverables as illustrated in (Figure 1).

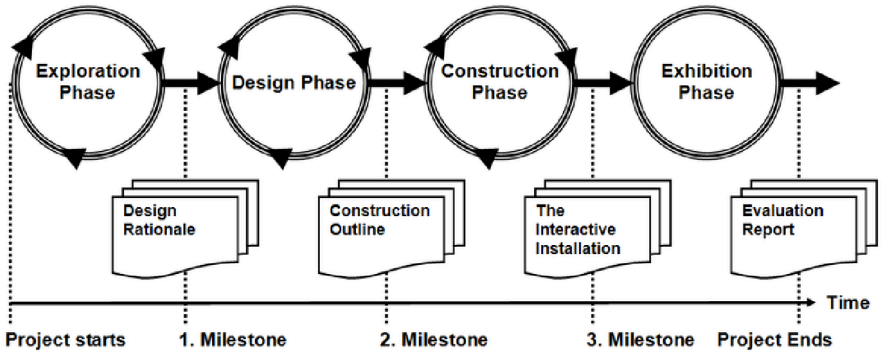

Fig 1 The time boxing four-phase model. Source: Situated Design Methods (Troels, Andreasen; Juul, Niels Christian; Rosendahl, Mads; 2014:276)

It focuses on the time-boxing of the deliverables during the process rather than on the activities. These elements are especially important when the interactive installation is to be used at an

exhibition or at an event with a fixed deadline (Troels, Juul, & Rosendahl, 2014).

- Exploration Phase: This stage aims to determine the best technology choice and elucidate the overall behaviour of the installation.
- Design Phase: During this stage, the architecture of the software and the surrounding area should be made clear.
- Construction Phase: The scanning functionality of the app was developed utilising AR libraries that work with common devices. Based on user feedback, wireframes, high-fidelity screens, and UX prototypes were continuously improved. Additionally, a QR code for scanning sculptures was created.
- Exhibition Phase: On-site user testing and feedback analysis are part of the deployment. Cycles of continuous improvement are used to address issues with ergonomics, accessibility, and interpretation.

Fig 2: Rani-ki-Vav, a world heritage site

Fig 3 SAPTI - Stone Artisan Park Training Institute, Ambaji

Fig 4: Lalbhai Dalpatbhai Museum, Ahmedabad

According to the timeboxing four-phase model, research work has been done in the exploration phase as follows:

1. Interviews were conducted on the world heritage site, Rani-ki-Vav, with local tourists, international tourists, students, teachers, professors, residents of Patan, tourist guides, elderly people and staff of the world heritage site, Rani-ki-Vav.
2. In order to collect all the information about the contents, visual gallery, and historical values used in the design of kiosk and augmented reality experiences, the author visited the following locations: Adalaj-ni-Vav, Gandhinagar; SAPTI - Stone Artisan Park Training Institute, Ambaji (Figure 3); Hemchandracharya North Gujarat University, Patan; Lalbhai Dalpatbhai Museum, Ahmedabad (Figure 4); Baroda Museum and Picture Gallery, Vadodara; Lakshmi Vilas Palace, Vadodara; Sun Temple, Modhera; Chhatrapati Shivaji Maharaj Vastu Sangrahalaya, Mumbai; Rani-ki-Vav, a world heritage site (Figure 2); and the Patan Patola Heritage Museum, Patan.

2.1 User Journey Mapping

The Rani-ki-Vav experience prior to the development of mobile app is depicted in the User Journey Map (Table 1). It describes every phase of the user's engagement, from organising the trip to exploring the website, and pinpoints their requirements, behaviours, problems, and feelings. This journey's mapping assisted in identifying user experience gaps and significant design intervention opportunities. It gave a basic understanding of how the mobile app may improve education and participation at the historical site.

By visualising these touchpoints together, the journey map exposes critical UX gaps, including scattered pre-visit information, minimal interpretive signage on-site, inconsistent guide narratives, and the absence of tools to identify deities, mudras, and symbolism.

Table1: User Journey Map

Steps	**Planning Visit**	**Arrival**	**Looking for Information**	**Hires a guide**	**Exploring Site**	**Identifying Sculptures**	**Engaging with space**	**Leaving the site**
User Actions	Searches online, reads blogs or Wikipedia	Reaches the site, buys ticket, enters premises	Reads ASI information board	Hires a guide by paying ₹500	Observes sculptures and carvings	Tries to recognize deities such as Vishnu, Shiva, etc. from mythology	Walks around, click photos, chat with others	Exits without full understanding
Feelings	Curious but underinformed	Confused /Overwhelmed	Under whelmed	Misinformed / Misled	Curious / Lost	Frustrated / Guessing	Visually pleased	Mixed feelings
User Needs	Want to understand site's significations	Needs direction and overview of site layout	Expert historical and cultural insights	Seeks accurate interpretation of sculptures and architecture	Wants to understand their identity and symbolism	Visual reference to identify divine figures	Desires a deeper emotional or spiritual connection	Would like to take something meaningful away
Touch points	Google, Social media, Tourist ;./sites	Ticket counter, Entry gate	One ASI board	Verbal interaction	Carvings, stairs, levels	Deity Sculptures	Garden, platforms, staircases	Exit gate
Pain points/ Gaps	Limited verified sources, scattered or outdated information	No Information center, No site map, unclear where to begin exploration	Only basic history is given, no mention of sculpture's meaning or mudras	Guides often provide incorrect or superficial information, especially about apsaras sculptures	Can't differentiate deities or interpret poses, no signboards or labels	Sculptures lack labels or identifier, myths not contextualized	Visual beauty present, but deeper meaning missing	Leaves with photos but many questions, unanswered, especially on symbolism & mudras

2.2 User Interface Designing

Now in the second phase of the model, the author has designed a system, content and AR experiences as follows:

The design of mobile app at Rani-ki-Vav follows the principles of People, Place, and Perspective. The insights from various stakeholders were incorporated to provide balanced information about the heritage of the site.

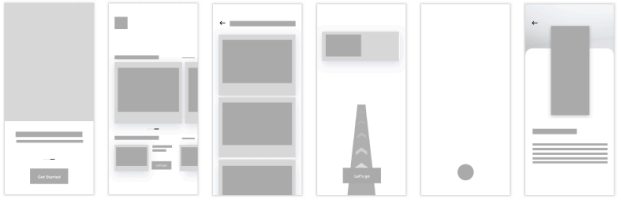

Fig 5: Wireframe of Mobile App

Wireframes (Figure 5) are low-fidelity representations of the mobile app interface, visualising layout, content flow, and functionality. They facilitate iterative refinement through user feedback, ensuring a user-centred design.

High-fidelity screens (Figure 6) showcase the final version of the mobile app interface with all visual elements.

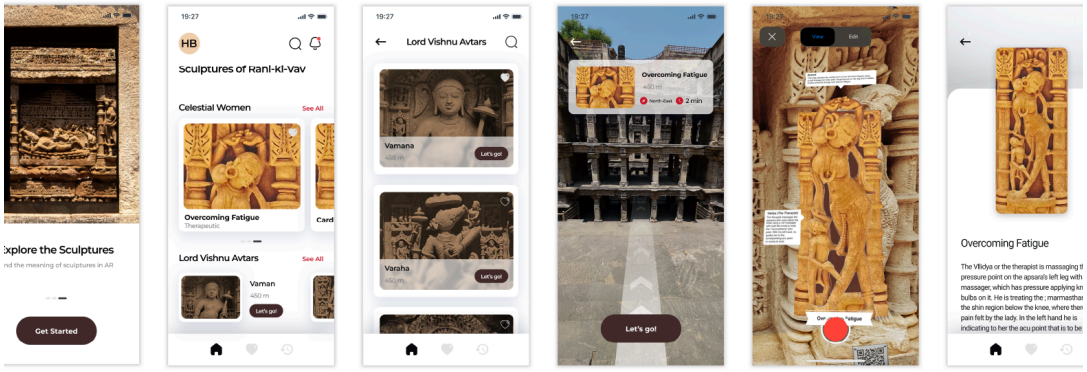

Fig 6: High-fidelity User Interface of Mobile App

3. Result

The Vav ni Dharohar mobile AR app demonstrably improved how visitors engaged with Rani-ki-Vav's sculptures and narratives. Grounded in a human-centred design process, the app allowed users to scan sculptures with their own smartphones, receive layered AR explanations of iconography and mythology, and navigate the site through guided routes, accessible text, and audio support. This shifted the experience from visually driven but partial understanding to a more informed, self-paced, and inclusive exploration of the stepwell's cultural and historical significance.

Field observations and on-site feedback indicated that visitors using the app spent more time at individual sculptures, asked more content-specific questions, and reported greater confidence in interpreting deities, mudras, and narrative scenes compared with the pre-app journey dominated by sparse signage and inconsistent guide information. These behaviours align with wider museum studies that link interactive, handheld interpretation to deeper learning, higher satisfaction, and stronger intention to revisit or recommend heritage sites.

3.1. Functionality:

- Users start by launching the app and selecting preferred language/voice narration mode.
- Using their phone's camera, they scan any sculpture; the app identifies its meaning in AR.
- An AR overlay appears, breaking down the sculpture into iconography, mythological context, and symbolic attributes (mudras, postures, associated stories).
- The app provides navigation routes, highlights must-see sculptures, and suggests further reading or audio tours.

4. Implementation and Technical Overview

To ensure compatibility and scalability across widely used smartphone devices, the Vav ni Dharohar mobile app was developed using cross-platform augmented reality libraries and modern mobile frameworks, such as Flutter and React Native. The AR vision pipeline utilises object identification models that have been trained to recognise specific sculptures; these models are triggered by scanning QR codes positioned next to important artefacts. Real-time AR overlays provide low latency feedback to maintain user engagement while exploring the site. To optimize usability, the team conducted iterative usability tests with diverse age groups and incorporated feedback to refine wireframes, high-fidelity interfaces, and core app interactions. Models for object detection are trained to identify

specific sculptures by scanning the QR code. Real-time AR overlays are implemented with low latency to maintain user interest.

5. Conclusion and Discussion

Fig 7: AR Scanning in Mobile App

The Vav ni Dharohar mobile app (Figure 7) aims to enhance heritage interpretation by integrating advanced technology with user-centered design. The app promotes research on heritage digitisation, tourist engagement, and cultural education by offering a captivating, easily accessible, and interactive experience with the sculptures of Rani-ki-Vav. It demonstrates a scalable approach for enhancing visitor understanding of complex architectural sites, supporting conservation education, and fostering deeper cultural connections through the use of immersive technology. By providing immersive and accessible digital experiences, the app facilitates deeper engagement with cultural heritage, promoting learning, empathy, and emotional connections.

It also provides some scholarly contributions which includes:

- Supporting heritage preservation by digitally highlighting intricate details and narratives of sculptural art that may be inaccessible or overlooked in physical visits, thus enhancing heritage appreciation and scholarly documentation.
- Providing a model for integrating AR into historical site interpretation, which can be extended to other monuments worldwide, creating new research opportunities in heritage technology, digital humanities, and participatory culture.
- Strengthening cultural identity by visually and experientially connecting visitors to the historical, religious, and artistic significance of Rani-ki-Vav and similar stepwells. It strengthens cultural identity and promotes both local pride and a broader scholarly conversation on water architecture and sacred landscapes.

This strategy aligns with the acknowledged architectural and cultural value of Rani-ki-Vav, an 11th-century stepwell that has been conserved by heritage organisations such as UNESCO and the Archaeological Survey of India, and is renowned for its extraordinary artistry and technological expertise. As a result, the Virasat app enhances academic discussions about the application of immersive digital tools for conservation education and heritage interpretation.

By offering evidence-based strategies for developing historical technologies that encourage participation, care, and ongoing interest, the Vav ni Dharohar mobile app enhances the design domain and contributes to broader conversations about digital heritage, experience design, and cultural preservation practices.

Future Scope

- Integration of animated reconstructions to visualize lost features of the sculpture.
- Audio storytelling and voice guides in more languages/dialects.

References

Amirthalingam, M. (2015). ECOLOGICAL TRADITIONS OF INDIA VOLUME - XI GUJARAT. C.P.R. Environmental Education Centre.

Avlonitou, C., & Papadaki, E. (2025). Using extended reality technologies in modern museums. Arts & Communication.

Chen, C., & Lai , H. (2021). Application of augmented reality in museums - Factors influencing the learning motivation and effectiveness. Sci Prog.

Chen, Y., Wang, X., Le, B., & Wang, L. (2024). Why people use augmented reality in heritage museums: a socio-technical perspective. Heritage Science.

Harvey, A. (2014). Creating Learning Experiences through Interactive Devices. The Journal of Museum Education, 39(2), 207-215.

Løvlie, A. S., Waern, A., Eklund, L., Spence, J., Rajkowska, P., & Benford, S. (2022). Hybrid Museum Experiences. In Hybrid Museum Experiences. Amsterdam University Press.

Lydens, L., Saito, Y., & Inoue, T. (2007). Digital Technology at the National Science Museum of Japan. The Journal of Museum Education, 32(1), 7-16.

Mankodi, K. (2012). RANI-KI-VAV, PATAN. New Delhi-110011: Published by the Director General Archaeological Survey of India.

Marcotte, P., & Bourdeau, L. (2006). Tourists' Knowledge of the UNESCO Designation of World Heritage Sites: The Case of Visitors to Quebec City. International Journal of Arts Management, 8, 4-13.

McKinney, S., Perry, S., Katifori, A., & Kourtis, V. (2020). Developing Digital Archaeology for Young People: A Model for Fostering Empathy and Dialogue in Formal and Informal Learning Environments. In Communicating the Past in the Digital Age. Greece: Ubiquity Press.

Mungona, K., & Thakre, K. (2025). Reviving the walls of times: Stepwell conservation and Adaptive reuse of Stepwell. Journal of Emerging Technologies and Innovative Research (JETIR), 12(4).

Neubauer, J. (1999). The stepwells of Gujarat. India International Centre Quarterly, 26(2), 75-80.

Prajapati, M., & Kava, T. (2022). Rani-Ki-Vav at Patan: An Architectural Heritage The magnificent step-well of forgotten India and a monument of unfathomable love. International Journal of Research and Analytical Reviews (IJRAR), 9(3), 602-615.

Rhee, B.-A., Pianzola , F., & Seo, Y.-E. (2025). An empirical study of visitors' engagement with a museumrobot guide and a mobile audio guide: a case study in SouthKorea. Museum Management and Curatorship.

Riley, D. (2018). UNESCO World Heritage Site RANI KI VAV. New Delhi: Discover India,.

Sadani, J. (1998). UNDERGROUND SHRINE Queen's Step-Well at Patan. Ahmedabad: B. J. Institute of Learning & Research.

Troels, A., Juul, N. C., & Rosendahl, M. (2014). Designing Software Based Interactive Installations. In Situated Design Methods. The MIT Press, Cambridge, Massachusetts.

Williams, G. H. (2012). Disability, Universal Design, and the Digital Humanities. In M. K. Gold (Ed.), Debates in the Digital Humanities (pp. 202-212). University of Minnesota Press.

Xu, W., Ismail, M., Shahruddin, S., Quan, W., & Li, Y. (2025). Exploring Tourists' Intentions to Adopt Augmented Reality in Cultural Heritage Museums: Insights From a Modified Technology Acceptance Model. SAGE Open.

Xu, W., Ismail, M., Shahruddin, S., Quan, W., & Li, Y. (2025). Exploring Tourists' Intentions to Adopt Augmented Reality in Cultural Heritage Museums: Insights From a Modified Technology Acceptance Model. Sage Open.

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Collective Wellbeing and Community Resilience: Towards a Social Design Approach

ABSTRACT

This conceptual paper positions Social Design as a comprehensive framework to overcome the limitations of technocentric urban models, particularly the erosion of social cohesion within dwellings and settlements. It integrates theories of well-being, resilience, commons, participation, relational space, reputation, and social capital into a systemic approach aimed at fostering collective well-being and community resilience. Drawing on reflexive inputs accumulated through applied research in a Prop-Tech real estate context, the paper advances two interrelated methodological frameworks. The first, Social Design for Value and Reputation, elucidates how participatory engagement and shared values generate symbolic capital and socio-cultural legitimacy. The second, Digital and Service Acceleration, illustrates how service systems and digital infrastructures can act as catalysts of positive social dynamics—such as neighbourliness, well-being, and local economic vitality.

The paper offers theoretically grounded reflections and a preliminary methodological articulation that demonstrate how Social Design can serve as a repeatable and participatory grammar for systemic value creation through communities, placing relational, behavioural, and social dynamics at the centre of the design process. Although the paper provides no empirical data, its propositions emerge from practice. They may inform policymakers, urban designers, and community practitioners seeking strategic approaches to urban governance where well-being, reputation, social cohesion, and legitimacy are at stake. As a conceptual contribution, its scientific impact is limited to theoretical elaboration, highlighting the need for future research to empirically test and operationalise these frameworks across diverse urban and cultural contexts, and to develop methods for measuring relational impacts. By synthesising multiple theoretical strands, the paper contributes an integrative and original perspective to ongoing debates on urban well-being, resilience, and reputation.

Keywords – Design Studies, Social Design, Well-Being. Community Resilience, Social Capital.

1. Introduction

Since the advent of the smartphone in 2007, urban and organisational innovation has been dominated by technocentric paradigms such as the “smart city.” Focused on data management and efficiency, these models have optimised services but neglected inclusion, empathy, and human connection. Their gains in infrastructure and delivery remain transactional, often failing to reinforce the social fabric on which well-being depends. Meanwhile, the erosion of social cohesion has become a central global concern.

The World Economic Forum Global Risks Report (2023) highlights fragmentation, institutional distrust, and polarisation as major threats to democratic stability and collective wellbeing. The COVID-19 pandemic further exposed this fragility, showing how the loss of relational infrastructures, spaces, routines, and networks that sustain cooperation can rapidly generate isolation and conflict.

The growing fragmentation of disciplines and policy frameworks calls for a systemic perspective on social challenges. Wellbeing, resilience, and social capital are often treated separately, as psychological, technical, or economic domains. yet they are inherently interdependent. Collective well-being depends on resilient communities, and resilience on the quality of social relationships. A conceptual framework linking these dimensions is therefore essential to address contemporary complexity.

Social Design offers such a response. As Manzini (2015) and Cottam (2018) argue, it marks a shift from "designing for" to "designing with" people, transforming design from a technical discipline into a form of social inquiry. Rather than producing artefacts or spaces, it creates conditions for interaction, care, and collective meaning. Positioned between Action Research and activism, Social Design is both a mindset and a methodology grounded in collaboration and reflexivity, a systemic approach that treats relationships, behaviours, and social infrastructures as its core materials.

This paper contributes to the discourse on Social Design by integrating insights from social sciences, design studies, and participatory practices. It positions Social Design as a repeatable, participatory grammar for systemic value creation, articulated through two interrelated frameworks. The first examines how participation and co-creation generate symbolic capital and legitimacy within and beyond communities; the second shows how services and digital infrastructures accelerate wellbeing, neighbourliness, and local economic vitality, reinforcing cohesion and adaptive capacity.

Together, these frameworks converge toward a central proposition:

Social Design is not about solving problems but about cultivating the conditions that allow systems to learn, adapt, and care for themselves.

By abstracting insights from applied research into theory, the paper proposes Social Design as a meta-framework that unites social, technological, and ethical knowledge to reimagine cities, institutions, and communities as ecosystems of co-creation where design, governance, and ethics sustain collective wellbeing and resilience.

2. From Industry to Society: towards a definition of Social Design

Emerging from the Industrial Revolution to enable mass production, design has long evolved beyond its technical roots in engineering and aesthetics. Dewey's Art as Experience (1934) reframed it as an inquiry into human experience, while Schön (1983) portrayed the designer as a "reflective practitioner," navigating uncertainty through learning and iteration. This reflexive stance paved the way for a shift from design thinking, centred on user innovation, to Social Design, where the focus moves from products to relations, processes, and collective capacities. Buchanan (1992) identified design as an integrative discipline spanning four orders: symbols, things, actions, and environments. Social Design extends this fourth order, shaping systems of meaning and cooperation. Rather than solving discrete problems, it orchestrates relationships among actors, infrastructures, and institutions within networks of reciprocity, care, and governance.

Defining Social Design

Social Design recognises that social systems can be intentionally shaped to foster wellbeing, justice, and resilience. Manzini (2015) describes it as "design for social innovation," creating conditions for collaborative change. Likewise, Mulgan et al. (2007) define social innovation as the participatory process through which new ideas and networks address unmet needs.

Cottam (2018) shows how trust-based welfare can replace bureaucracy, while Ehn and Topgaard (2014) see design as a democratic act of "making futures," where participation is both the process and the outcome. Unlike traditional design or policy planning, Social Design does not offer fixed solutions; instead, it creates conditions for people to co-create meaning, share resources, and build resilience together. It serves as a platform for social learning, connecting communities, institutions, and technologies to co-produce well-being.

Social Design as Enabling Practice

At its core, Social Design is an approach that helps people collectively reshape their realities by creating supportive conditions. Rather than providing solutions, it builds the contexts where solutions can emerge, linking to ideas of resilience (Aldrich, 2012) and participatory governance (Ostrom, 1990; Mattei, 2011). The designer or researcher acts as a facilitator, helping communities imagine, test, and establish new practices — from shared digital tools to care networks. These processes build capacity, helping systems adapt, cooperate, and grow. In this sense, Social Design connects theory and practice, turning wellbeing and resilience into tangible parts of everyday life.

3. Towards Theoretical Foundations of Social Design

The concept of Social Design arises at the crossroads of multiple theoretical traditions united by a common question: how can societies foster wellbeing and resilience through relational, participatory, and systemic practices? This section outlines the key foundations of that question, drawing from wellbeing theory, resilience studies, and the commons, to frame Social Design as an integrated model for collective flourishing and renewed social capital within relational spaces.

Wellbeing

Well-being is a multidimensional condition encompassing physical, psychological, and social dimensions. Inghilleri (2021) describes "healing places" as environments that foster care, empathy, and self-realisation, highlighting wellbeing as co-produced between people and their contexts. This view departs from individualistic notions of well-being as mere satisfaction. Bruni and Porta (2005) advocate a relational economy of happiness, where welfare arises from meaningful connections rather than material gain. Wilkinson and Pickett (2009) further show that equality and social trust enhance collective wellbeing, demonstrating that wellbeing is a property of relational systems promoting dignity, reciprocity, and inclusion.

Resilience

Originally rooted in ecology, resilience describes a system's capacity to absorb shocks and reorganise while maintaining function. In social theory, it has come to mean the ability of communities to learn and transform through adversity (Wright, 2022), highlighting resilience as a dynamic process rather than a return to stability. Aldrich (2012) shows that communities rich in trust and civic engagement recover faster after crises, proving that resilience relies more on relationships than infrastructure. Ramos (2016)

adds that the "city as commons" fosters resilience through participatory governance. Together, these views define resilience as an emergent property of connectedness, rooted in collaboration, learning, and adaptability.

Commons and Participation

The recent renaissance of the commons within cultural and political discourses related to cities, has reshaped ideas of community and governance. Mattei (2011) defines the commons as a political and ethical category beyond the public–private divide, grounding cooperation in shared responsibility. Ostrom (1990) similarly proved that communities can self-manage resources through collective institutions, challenging the need for centralised control. Within this framework, participation becomes the essence of collective agency. Venturi and Zandonai (2019) highlight the "dimension of place" where civic engagement and social enterprise converge, allowing fragmented societies to reconnect through local action. Participation thus generates legitimacy and accountability by embedding decision-making in lived community experience.

Relational Space

Urban theorists have long argued that space is not a neutral backdrop for social life but a medium through which relationships are formed and maintained. Jacobs (1961) described the "sidewalk ballet" of everyday interactions as the foundation of urban vitality, demonstrating how proximity, visibility, and diversity produce trust and safety. Lefebvre (1974) conceptualised space as a social product, created and re-created through practices, symbols, and power relations. For him, to understand or design a space requires acknowledging the social processes that continuously shape it. Sennett (2012) contributes to this lineage by defining cooperation as a spatial practice: the design of environments that allow for openness, negotiation, and mutual recognition.

Social Capital and Reputation

Social capital bridges the micro-level of relationships and the macro-level of well-being. Putnam (2000) distinguishes between bonding capital, which reinforces cohesion, and bridging capital, which connects diverse groups and enables inclusivity, crucial for social innovation and democratic governance. Coleman (1988) defines social capital as a resource that fosters collective action through trust and shared norms, while Granovetter (1973) shows that weak, diverse ties often drive adaptability and innovation. These insights are central to Social Design, which treats networks and trust as design materials. Extending this to the symbolic realm, reputation reflects the authenticity of shared values and practices. As Govers (2018) and Anholt (2010) argue, a community's legitimacy stems not from image management but from the credibility of its collective actions.

Towards a theoretical framework: synthesis and preliminary considerations

Across these multidisciplinary perspectives, a coherent view emerges: wellbeing and resilience are interdependent outcomes of relational systems. Communities flourish when they co-manage commons, sustain participation, and maintain networks of trust that extend beyond immediate boundaries. While space and technology act as enablers, sustainability ultimately rests on social connectedness and collective meaning-making.

Social Design encapsulates this synthesis as a meta-framework integrating relational, participatory, and systemic dimensions of social life. It:

- Treats wellbeing as a systemic quality, rooted in infrastructures of cooperation and empathy;
- Frames resilience as a cultural capacity, cultivated through participatory processes of care and learning;
- Identifies participation as the core mechanism for co-creating social infrastructures and maintaining commons;
- Views relational space as both object and outcome of design, where interdependence is orchestrated rather than imposed;
- Understands reputation as an emergent form of social capital, expressing coherence between practice and representation.

By aligning these domains, Social Design reframes design as the cultivation of adaptive and caring systems, where value arises through cooperation, legitimacy through participation, and stability through renewal. Despite this convergence, several gaps remain. Theories of social capital and governance (Putnam 2000; Coleman 1988; Ostrom 1990; Mattei 2011) explain cooperation but lack design-based methods to sustain it. Conversely, design scholarship (Manzini 2015; Cottam 2018) describes participatory innovation but seldom connects it to broader sociological theories of wellbeing and resilience. Most social innovation models remain local and temporary, depending on specific contexts and leaders rather than scalable systems. Digitalisation adds both promise and risk: it can strengthen participation and shared intelligence, but also deepen inequality and isolation if not grounded in strong social frameworks. The key challenge is to design digital and service systems that support collective wellbeing instead of replacing human connection.

This paper does not aim to provide empirical proof, but to outline a conceptual framework for future applied and comparative research.

4. Research Question

Despite wide academic and policy interest, a clear gap persists between recognising social interdependence and designing systems that truly support it. This gap appears in fragmented approaches: wellbeing is seen as an individual issue, resilience as a matter of infrastructure and risk management, and participation as consultation rather than genuine co-creation. Against this challenge and within the above theoretical background, this paper aims to address the following question with a strong orientation to active implementation:

What are Conceptual Frameworks activating Social Design as a repeatable, participatory, and systemic approach capable of enabling collective wellbeing and community resilience?

This research question is designed to articulate a theoretical and conceptual grammar where dispersed strands of social innovation, design thinking, and community development might converge into a coherent framework. The underlying hypothesis is that Social Design, understood as the design of social relations and infrastructures, offers such a unifying paradigm.

5. Epistemological and Methodological Background

As a conceptual paper, this study does not include an empirical methodology but draws on key epistemological and methodological foundations to frame the proposed conceptual frameworks. Social Design rests on two complementary references—social constructivism and Action Research—which together define its reflexive and participatory nature. Furthermore, a third pillar, systems thinking,

completes this foundation by situating Social Design within an adaptive and interconnected understanding of social change.

The constructivist episteme

From a constructivist perspective, social reality is not fixed but continuously co-produced through dialogue, interpretation, and practice (Berger & Luckmann, 1966; Gergen, 1999), where the core focus of research shifts from world-mirroring procedures to world-making ambitions (Gergen, 2015). From this perspective, the researcher's role is not to impose order but to enable collective meaning-making. In this sense, Social Design becomes a "meta-design" practice, a way of designing the very processes through which design happens.

Action Research as a methodology

Action Research embodies this constructivist approach within the social sciences. Emerging in the 1960s in education and healthcare, it was socially driven to create positive change through participation. Reason and Bradbury (2001) define it as a participatory and iterative process that blends reflection, experimentation, and learning. The researcher works with participants to create and study change at the same time. In this cyclical model, theory and practice are intertwined, each continuously shaping the other.

Systemic Orientation

While participatory design focuses mainly on involving users, Social Design broadens participation to the systemic level (Friedman, 2019), connecting human, institutional, and technological dimensions into a unified framework. It applies systems theory to explore how changes in one part of a network can generate ripple effects throughout the whole social fabric.

This systemic orientation implies that Social Design operates simultaneously at multiple scales:

- Micro-level: interpersonal relations, trust, empathy, and collective learning;
- Meso-level: community networks, organisations, and governance structures;
- Macro-level: societal narratives, institutional norms, and digital ecosystems.

By working across different scales, Social Design supports what Manzini (2015) calls "cosmopolitan localism", the ability of communities to act locally while staying connected globally through shared values and digital networks. It views resilience and wellbeing as outcomes that emerge from interlinked systems, not as fixed targets. Combining constructivism and action research makes Social Design an adaptive, self-reflective practice that evolves through feedback and iteration. It follows loops of inquiry, cycles of testing, observing, and reshaping social relations, reflecting Meadows's (2008) principles of systems thinking. Through this ongoing learning process, Social Design acts less as a rigid framework and more as a catalyst for continuous transformation.

6. Developing Conceptual Frameworks of Social Design

As a point of extreme synthesis of all the above, Social Design might be conceptualised as a systemic architecture composed of two interdependent frameworks that separately describe the relational and infrastructural dimensions of social value creation. Together, they illustrate how well-being, resilience, and legitimacy emerge not as isolated outcomes but as the effects of recursive processes that connect people, infrastructures, and shared meaning. These frameworks are presented not as empirical models

but as conceptual mechanisms, abstract structures capable of being adapted to multiple contexts. They provide a coherent language to describe how relational systems evolve and how social innovation can be sustained through enabling infrastructures.

The first framework, "Social Design for Value and Reputation", explains the internal logic through which social participation and co-creation generate symbolic and reputational capital. The second, "Digital and Service Acceleration", describes the mechanisms by which infrastructures and services sustain and amplify these dynamics across scales.

Social Design Conceptual Framework 1: Social Design for Value and Reputation

The first framework captures the relational mechanism through which participation and collaboration generate shared values and, over time, collective reputation. It describes how the micro-processes of engagement lead to macro-level legitimacy and recognition.

The model unfolds through three interconnected phases, namely: 1) Engagement and Co-creation; 2) Shared Values and Symbolic Capitals; and 3) Legitimacy and Reputation:

1. **Engagement and Co-creation** Every Social Design process begins with active participation. Through co-creation, people collectively shape their environments, building networks of trust and collaboration. These participatory practices form the relational foundation for developing social capital. They embody what Dewey (1934) and Schön (1983) described as reflective inquiry, learning through action and creating meaning from experience.
2. **Shared Values and Symbolic Capital** As participation grows, shared values start to emerge. Principles such as care, reciprocity, and equity form the basis of symbolic capital (Bourdieu, 1986), strengthening cohesion and belonging. Symbolic capital becomes the shared resource through which communities build narratives of identity and purpose, key to continuity and mutual recognition. In Social Design, these narratives are themselves designed artefacts: relational outcomes of co-created meaning.
3. **Legitimacy and Reputation** Over time, shared values evolve into reputation—the outward expression of internal trust and coherence. As Anholt (2010) and Govers (2018) suggest, reputation reflects social integrity: a form of symbolic legitimacy that grows from authentic practice rather than strategic communication. This progression from participation to reputation creates a value cycle where internal wellbeing and external credibility continuously strengthen each other.

A feedback loop links these stages: the legitimacy and visibility gained through collective reputation attract new participants and resources, restarting the cycle of co-creation. In this way, the framework becomes a self-sustaining process of value creation, where trust, cooperation, and recognition continuously renew social systems.

Social Design Conceptual Framework 2: Digital and Service Acceleration

The second framework describes the infrastructural mechanism of Social Design, focusing on how digital technologies and service systems can accelerate, scale, and sustain the relational dynamics outlined above. While the first framework addresses the social fabric, this one explains the operational layer that enables that fabric to evolve.

The framework consists of three interdependent layers, namely: 1) Enabling Infrastructures and Service Systems; 2) Domains of Social Impact; and 3) Integrated Outcomes.

1. Enabling Infrastructures and Service Systems
   Digital and service infrastructures—including communication platforms, data systems, and distributed governance tools—act as enablers of participation and coordination. Their purpose is not to replace human relations but to enhance connectivity, transparency, and accessibility. In systemic design terms (Friedman, 2019; Meadows, 2008), they form the structural conditions for feedback and adaptation.

2. Domains of Social Impact
   These infrastructures produce effects across several interlinked domains:

   - Efficiency and shared resource management, by promoting collaborative consumption and reducing redundancy;
   - Health and well-being, through preventive, data-informed, and community-centred services;
   - Neighbourliness and inclusion, by fostering local interaction, empathy, and diversity;
   - Local economy, by enabling small-scale entrepreneurship and circular value creation.
     Each domain operates as an entry point for resilience and collective well-being.

3. Integrated Outcomes
   When these domains converge, they yield integrated outcomes: social cohesion, adaptive resilience, and reputational legitimacy. These are emergent rather than additive results, reflecting the interconnectedness of the system. Social Design thus becomes an infrastructure for wellbeing, not merely a design philosophy.

A feedback loop sustains this conceptual mechanism as well. Data, narratives, and behavioural insights generated through digital and service systems are fed back into participatory processes, refining governance and ensuring ongoing relevance. This cyclical exchange transforms infrastructures from static tools into learning systems, adaptive and reflexive structures aligned with social purpose.

To summarise, these conceptual frameworks articulate the architecture of Social Design as a theory of transformation. They offer a vocabulary for understanding how well-being, resilience, and legitimacy emerge as co-produced phenomena, shaped by the interplay between human cooperation and the infrastructures that sustain it.

4. Discussion

The two conceptual frameworks articulated above, Social Design for Value and Reputation and Digital and Service Acceleration, provide a coherent architecture through which the logic of Social Design can be interpreted as both a theory of value creation and a method of systemic transformation. This section discusses their implications for design theory, social sciences, and governance, highlighting the epistemological and methodological contributions that emerge from their integration.

Theoretical implications: from design objects to social systems

The proposed frameworks shift design from creating artefacts to orchestrating social systems. As Manzini (2015, 2021) notes, designers now shape “relationships between things and people,” positioning Social Design as a meta-disciplinary field uniting social theory, ethics, and systems

thinking. This view aligns with Krippendorff's (2006) idea of design as making sense of things, a process of constructing meaning, and with Simon's (1969) definition of design as a science of the artificial, capable of intentional intervention in complex systems. Applied to the social realm, Social Design becomes a science of relational systems, creating conditions for interaction, recognition, and collective well-being. The two frameworks together redefine value creation: in the relational one, value arises from trust and shared identity; in the infrastructural one, it is sustained through digital and service systems that expand participation. They outline a non-linear economy of meaning, where value is co-produced and continuously renewed.

Methodological implications: designing with systems

The methodological significance of Social Design lies in its reflexive and iterative nature. Both frameworks operate through feedback loops that embody learning and adaptation, core principles of systems thinking (Meadows, 2008). This cyclical logic sets Social Design apart from traditional planning and aligns it with systemic design and participatory governance (Friedman, 2019; Ehn & Topgaard, 2014). Here, design outcomes, whether symbolic, relational, or infrastructural, are not final results but steps in an ongoing process of observation and transformation, similar to Action Research (Reason & Bradbury, 2001), where knowledge develops through participation.
This cyclical nature also carries ethical significance. Escobar (2018) advocates for "autonomous design," which allows communities to shape their own futures. The relational framework supports this through participation and symbolic capital, while the infrastructural framework puts it into practice by creating the platforms, services, and interfaces that sustain collective autonomy.

Integration and Systemic Coherence

The two frameworks operate as complementary dimensions of a single ecosystem. The first explains the social logic of how value is produced through relationships, while the second articulates the systemic logic of how that value can be maintained and scaled through enabling infrastructures.

Their interaction constitutes the essence of the Social Design approach:

- The relational mechanism (Framework 1) generates meaning, cohesion, and trust—the qualitative value of social systems.
- The infrastructural mechanism (Framework 2) provides the means to operationalise and extend that value—the quantitative and temporal dimension of sustainability.

Together they form a recursive, self-reinforcing structure: social interactions create shared meaning; infrastructures amplify and stabilise those meanings; the resulting legitimacy feeds back into further participation. This circular dynamic exemplifies what Manzini (2015) calls design for social innovation: a process that enables communities to design the very systems through which they evolve.

Toward Social Design as a meta-framework

By connecting social, technological, and symbolic dimensions, Social Design can be seen as a meta-framework for collective wellbeing. Its value lies not in prescribing solutions but in offering a structure, a shared grammar that enables collaboration across disciplines around principles of participation, care, and adaptability. This meta-framework bridges micro-level practices such as community engagement and participatory governance with macro-level systems like digital

infrastructures and institutional policies. It reframes well-being and resilience as emergent outcomes of ongoing negotiation among people, technologies, and meanings.

8. Future Research: Social Design as Governance Paradigm

Future research focusing on Social Design should build on this conceptual foundation in four directions:

- First, by operationalising the frameworks through empirical studies that measure relational and reputational impact using hybrid indicators (qualitative, network-based, and digital).
- Second, by exploring the role of generative AI and emerging technologies in mediating participation, transparency, and design ethics within social systems.
- Third, by connecting Social Design with the arts and humanities, using creative practices as laboratories for empathy, narrative, and collective imagination.
- Fourth, by investigating the possibilities and opportunities to stretch and expand the notions of Social Design into larger areas of potential impact within societies and cultures where challenges as identified in the theoretical and bibliographic review exist.

Future research should explore how Social Design can evolve from a methodology into a paradigm of governance, complementing institutional mechanisms with relational and collaborative forms of regulation. Latour's (2005) Actor-Network Theory frames this shift, viewing social systems as co-produced by humans, technologies, and infrastructures. Within such a networked ontology, Social Design mediates between material and symbolic dimensions, coordinating distributed actors.

This makes Social Design especially suited to tackling "wicked problems" (Buchanan, 1992), complex, interdependent challenges that call for adaptive governance rooted in local knowledge. It promotes a relational model of legitimacy, where authority arises from shared meaning, empathy, and reputation rather than hierarchy. By bridging public and private spheres and placing the commons (Mattei, 2011; Ostrom, 1990) at the centre of design, Social Design fosters emergent, not imposed, forms of governance, a state of conviviality (Thackara, 2005) where social, ecological, and technological systems sustain one another.

9. Conclusions

This paper has presented Social Design as a comprehensive theoretical framework for understanding and fostering collective wellbeing and community resilience. Drawing on design theory, social sciences, and systems thinking, it introduces two interconnected frameworks—Social Design for Value and Reputation and Digital and Service Acceleration—which together explain the relational and infrastructural dynamics of how social value is created.

Three key insights emerge from this conceptual elaboration:

- First, well-being is redefined not as an individual condition but as an emergent property of relational systems. Communities thrive when their members can co-create meaning, share responsibility, and cultivate mutual care. Social Design provides the conceptual tools to design such enabling conditions, positioning participation and empathy as design materials.
- Second, resilience is reframed as a cultural and systemic capability. It is less about recovery after a crisis and more about the ongoing capacity to adapt, learn, and reorganise collectively. Through iterative cycles of feedback, reflection, and redesign, Social Design enables

communities and institutions to build the adaptive infrastructures that sustain resilience over time.

- Third, reputation emerges as the symbolic outcome of this process, a form of legitimacy derived from coherence between values and actions. Reputation is not an external asset but a social mirror, reflecting the authenticity of collective practices. It connects internal well-being with external recognition, thereby reinforcing trust and continuity.

Together, these three dimensions form the grammar of Social Design: wellbeing as purpose, resilience as process, and reputation as outcome. The two frameworks outlined in this paper show how these dimensions interact within a recursive, self-sustaining system, where relational processes generate meaning and infrastructures ensure continuity and amplification.

Theoretically, this synthesis positions Social Design as a meta-discipline, a transdisciplinary field connecting design, sociology, governance, and digital culture. Methodologically, it emphasises reflexivity, iteration, and participatory inquiry, aligning with traditions of Action Research and systemic design. Ethically, it promotes a paradigm of care and autonomy, echoing Escobar's (2018) "designs for the pluriverse" and Manzini's (2021) "cities that care."

In conclusion, Social Design offers both a theory and a practice of collective transformation. It reclaims design as a fundamentally social act, one that empowers communities to imagine, create, and sustain their own systems of wellbeing, resilience, and reputation. In doing so, it provides a conceptual lens for seeing future societies not as networks of individuals or data, but as living, learning, and caring systems.

References

Aldrich, D. P. (2012). Building resilience: Social capital in post-disaster recovery. Chicago: University of Chicago Press.

Anholt, S. (2010). Places: Identity, image, and reputation. London: Palgrave Macmillan.

Berger, P. L., & Luckmann, T. (1966). The social construction of reality: A treatise in the sociology of knowledge. New York: Anchor Books.

Bonomi, A., & De Rita, G. (1998). Manifesto per lo sviluppo locale. Bologna: Il Mulino.

Bourdieu, P. (1986). The forms of capital. In J. Richardson (Ed.), Handbook of theory and research for the sociology of education (pp. 241–258). New York: Greenwood Press.

Bregman, R. (2017). Utopia for realists: How we can build the ideal world. London: Bloomsbury.

Bruni, L., & Porta, P. L. (2005). Economics and happiness: Framing the analysis. Oxford: Oxford University Press.

Buchanan, R. (1992). Wicked problems in design thinking. Design Issues, 8(2), 5–21.

Castells, M. (2012). Networks of outrage and hope: Social movements in the internet age. Cambridge: Polity Press.

Coleman, J. S. (1988). Social capital in the creation of human capital. American Journal of Sociology, 94, S95–S120.

Cottam, H. (2018). Radical help: How we can remake the relationships between us and revolutionise the welfare state. London: Virago.

Dewey, J. (1934). Art as experience. New York: Minton, Balch & Company.

Ehn, P., & Topgaard, R. (Eds.). (2014). Making futures: Marginal notes on innovation, design, and democracy. Cambridge, MA: MIT Press.

Escobar, A. (2018). Designs for the pluriverse: Radical interdependence, autonomy, and the making of worlds. Durham, NC: Duke University Press.

Friedman, K. (2019). Systemic design theory: Integrating systems thinking and design. London: Routledge.

Gergen, K. J. (1999). An invitation to social construction. London: SAGE.

Govers, R. (2018). Imaginative communities: Admired cities, regions and countries. Antwerp: Reputo Press.

Granovetter, M. (1973). The strength of weak ties. American Journal of Sociology, 78(6), 1360–1380.

Inghilleri, P. (2021). I luoghi che curano. Milan: Raffaello Cortina.

Jacobs, J. (1961). The death and life of great American cities. New York: Random House.

Kavaratzis, M., & Ashworth, G. (2015). Rethinking place branding: Comprehensive brand development for cities and regions. New York: Springer.

Krippendorff, K. (2006). The semantic turn: A new foundation for design. Boca Raton: CRC Press.

Latour, B. (2005). Reassembling the social: An introduction to actor-network theory. Oxford: Oxford University Press.

Lefebvre, H. (1974). The production of space. Oxford: Blackwell.

Manzini, E. (2015). Design, when everybody designs: An introduction to design for social innovation. Cambridge, MA: MIT Press.

Manzini, E. (2021). Livable proximities: Ideas for the city that cares. Milan: EGEA.

Manzini, E., & Jegou, F. (2003). Sustainable everyday: Scenarios of urban life. Milan: Edizioni Ambiente.

Mattei, U. (2011). Beni comuni: Un manifesto. Bari: Laterza.

Meadows, D. H. (2008). Thinking in systems: A primer. White River Junction, VT: Chelsea Green Publishing.

Mulgan, G., Tucker, S., Ali, R., & Sanders, B. (2007). Social innovation: What it is, why it matters and how it can be accelerated. Oxford: Skoll Centre for Social Entrepreneurship, Said Business School, University of Oxford.

Ostrom, E. (1990). Governing the commons: The evolution of institutions for collective action. Cambridge: Cambridge University Press.

Papanek, V. (1984). Design for the real world: Human ecology and social change. Chicago: Academy Chicago Publishers.

Putnam, R. D. (2000). Bowling alone: The collapse and revival of American community. New York: Simon & Schuster.

Ramos, J. M. (Ed.). (2016). The city as commons. Melbourne: Commons Transition Coalition.

Reason, P., & Bradbury, H. (Eds.). (2001). Handbook of action research: Participative inquiry and practice. London: SAGE.

Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. Policy Sciences, 4(2), 155–169.

Schön, D. A. (1983). The reflective practitioner: How professionals think in action. New York: Basic Books.

Sennett, R. (2012). Together: The rituals, pleasures and politics of cooperation. New Haven: Yale University Press.

Simon, H. A. (1969). The sciences of the artificial. Cambridge, MA: MIT Press.

Thackara, J. (2005). In the bubble: Designing in a complex world. Cambridge, MA: MIT Press.

Venturi, P., & Zandonai, F. (2019). Dove. La dimensione di luogo che ricompone impresa e società. Milan: EGEA.

Wilkinson, R., & Pickett, K. (2009). The spirit level: Why equality is better for everyone. London: Penguin.

World Economic Forum. (2023). Global risks report 2023. Geneva: World Economic Forum.

Wright, K. (2022). Community resilience: A critical approach. New York: Routledge.

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Beyond Decoration: The Emotional Psychology of Art Placement in Contemporary Interiors

ABSTRACT

Art placement within interior environments is more than aesthetic embellishment; it exerts measurable effects on emotion, cognition, and spatial experience. This paper examines the dual role of art in contemporary interiors: as an affective stimulus that shapes mood, perception, and wellbeing, and as a functional design element embedded within acoustic systems, partitions, lighting, and furniture. Drawing on environmental psychology, neuroaesthetics, and design theory, the study synthesises evidence on how scale, imagery, and spatial positioning influence stress reduction, attention restoration, identity formation, and social behaviour. Case analyses from healthcare, public cultural districts, and commercial settings illustrate how strategic art integration improves wayfinding, reduces anxiety, and strengthens place identity. The paper also outlines emerging functional typologies, including acoustic art panels and object-art furniture, demonstrating how artistic interventions enhance both performance and ambience. By framing art as a deliberate, evidence-informed component of interior design, the study offers a multidisciplinary foundation for advancing wellbeing-oriented and functionally responsive spatial practices.

Keywords - Art Placement, Interior Design Psychology, Neuroaesthetics, Environmental Psychology, Functional Art, Wellbeing in Design, Art and Aesthetics.

1. Introduction

In the evolution of interior design, art has traditionally been relegated to a decorative afterthought — a painting above a sofa, a framed print in a corridor, a sculpture placed in an atrium. While such gestures contribute to visual enrichment, they seldom exploit the full psychological and functional potential of art. Contemporary design research and practice increasingly demonstrate that art, when strategically selected and placed, can recalibrate how occupants feel, behave, and interact within a space.

Environmental psychology has long argued that spatial perception is linked to human wellbeing. Ulrich's (1984) landmark study of hospital recovery rates revealed that exposure to visual stimuli — even a simple view of trees — could reduce stress and accelerate healing. The Kaplans (1989) advanced this with attention restoration theory, showing how visual complexity, natural motifs, and "soft fascination" relieve mental fatigue.

Even in classical Indian aesthetic theory, texts such as the Rasa Theory, Shilpa Shastra, and Chitrasutra long asserted that visual form, colour, proportion, and narrative imagery shape emotional and psychological states. The concept of rasa describes how specific aesthetic cues evoke distinct moods, anticipating contemporary neuroaesthetic findings that artworks activate emotion–valuation networks in the brain. Similarly, the Chitrasutra's emphasis on harmony, balance, and visual coherence parallels modern evidence that

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structured, symmetrical imagery reduces cognitive load and supports attentional ease, while the Shilpa Shastra's proportional canons align with environmental psychology's insights on spatial order and wellbeing. These classical perspectives demonstrate that the psychological impact of art in interior environments—now measured through neuroscience—has deep historical roots in Indian aesthetic thought.

Parallel developments in neuroscience, especially neuroaesthetics (Zeki, 1999; Chatterjee, 2014), provide evidence that encounters with beauty stimulate reward pathways in the brain, influencing both emotion and cognition. These findings converge on a central proposition: visual experience — including curated artworks and artful design interventions — exerts a measurable psychological impact.

Beyond psychological resonance, art can assume functional responsibilities within interiors. Acoustic art panels absorb sound while displaying meaningful imagery; sculptural partitions define spatial boundaries without rigid walls; artist-designed lighting fixtures provide both illumination and symbolic narrative.

Institutions such as the Cleveland Clinic and Maggie's Centres demonstrate how systemic art integration supports healing and wellbeing, while public initiatives like Delhi's Lodhi Art District and airport cultural programmes show art's capacity to orient, calm, and educate at scale.

This paper builds on these theoretical and empirical foundations to explore two linked questions: (1) How does the placement and selection of art within interiors shape psychological and emotional experience? and (2) In what ways can art be integrated as a functional element that extends beyond ornamentation to support spatial performance? By addressing these questions through literature, empirical studies, and case analyses, the paper contributes to a growing discourse that situates art at the intersection of wellbeing, identity, and design utility.

2. Methodology

This study adopts a combined qualitative literature review and integrative review methodology to investigate the psychological and functional impact of art placement in interior environments. Peer-reviewed publications from 1984 to 2024 were sourced through ScienceDirect, PubMed, JSTOR, and Google Scholar using targeted keywords related to art placement, environmental psychology, neuroaesthetics, restorative environments, and functional interior elements. Foundational studies such as Ulrich's (1984) experimental work on visual stimuli and stress recovery, Kaplan's (1995) articulation of Attention Restoration Theory, and contemporary neuroaesthetic research by Chatterjee (2014) provided the theoretical basis for understanding emotional and cognitive responses to aesthetic experience. Complementary reviews from public health and design fields (e.g., Stuckey & Nobel, 2010; Iyendo, 2016; Schreuder et al., 2016) were included to contextualize art's documented effects in clinical and public settings.

In parallel, an integrative review approach incorporated architectural case analyses, institutional programme reports, and technical studies on functional art elements, including acoustic panel research (e.g., Chojnacki et al., 2023) and urban art–wellbeing investigations (e.g., Mikuni et al., 2024).

In addition, Indian traditional visual arts and aesthetics—including folk murals, wall paintings, and temple and palace sculptures—were examined to understand their historical, cultural, and psychological impact on spatial experience and well-being. An integrative analysis of findings

enabled the identification of recurrent patterns in psychological mechanisms, spatial behaviour, sensory modulation, and functional performance. This methodological synthesis enabled a multidisciplinary understanding of how art operates simultaneously as an emotional catalyst, cognitive modulator, and functional design component within contemporary interiors.

3. Theoretical Foundations

Understanding the psychological and emotional impact of art placement in interior spaces requires a multidisciplinary theoretical grounding. Theories from environmental psychology, neuroscience, aesthetics, and design studies together provide the conceptual scaffolding for why art affects perception, mood, and behavior, and how its integration as a functional element can extend beyond decoration.

Classical Indian thought has long recognized the impact of visual arts on human well-being. Wall paintings, murals, and sculptures in temples, palaces, and traditional homes were created not merely as decoration but as carriers of cultural symbolism, spiritual meaning, and emotional resonance. Folk and regional styles—such as Madhubani, Warli, Mandana, tribal murals, and temple reliefs—engage viewers, evoke harmony, and cultivate aesthetic and emotional balance. In temples, sculpted deities and painted narratives guide devotion; in palaces, murals reinforce cultural identity; in homes, folk wall art celebrates rituals and communal memory. The careful arrangement of motifs, colors, and forms reflects a classical understanding that visual arts actively contribute to psychological, emotional, and spiritual well-being. Modern interior design continues this tradition, using murals and sculptural elements to create spaces that foster calm, beauty, and holistic wellness.

3.1 Environmental Psychology and Restorative Environments

Environmental psychology offers a foundational lens for examining how visual and spatial features influence mental states. Ulrich's (1984) stress reduction theory posits that exposure to certain visual stimuli—particularly natural elements—reduces physiological stress responses such as elevated blood pressure and cortisol levels. Similarly, Kaplan and Kaplan's (1989) attention restoration theory explains how exposure to environments with "soft fascination" restores depleted attentional resources and reduces cognitive fatigue. These frameworks suggest that strategically placed art, especially biophilic or nature-inspired works, can replicate aspects of restorative environments even in highly urban or clinical settings. For instance, murals in hospitals depicting natural landscapes have been shown to elicit calming effects comparable to actual views of greenery (Nanda et al., 2012).

3.2 Cross-Disciplinary Evidence of Art's Restorative Influence

Evidence from public health and healthcare design strengthens these theoretical models by showing measurable wellbeing benefits of visual art in real environments. Stuckey and Nobel's (2010) review demonstrates that exposure to art reliably reduces anxiety and supports emotional regulation across clinical settings, while Iyendo (2016) identifies calming imagery and nature-based visuals as key design elements that lower stress and improve patient experience. Schreuder et al. (2016) likewise find that patients consistently rate artwork and visual ambience as central components of a healing interior. Extending beyond clinical contexts, Mikuni et al. (2024) show that public art installations can significantly reduce stress and negative mood, underscoring art's broader restorative potential. Together, these studies offer empirical grounding for the psychological mechanisms through which art influences interior experience.

3.3 Neuroaesthetics and Cognitive Processing of Art

Neuroaesthetics provides a complementary scientific framework, examining how aesthetic experiences are processed in the brain. Chatterjee (2014) introduced the "aesthetic triad" model, which describes three interacting systems engaged during art perception: (a) sensory-motor processing of visual stimuli, (b) emotion-valuation circuits (particularly in the orbitofrontal cortex and ventral striatum), and (c) meaning-making networks that link art to memory and cultural knowledge. Zeki's (1999) studies further reveal that perceiving symmetry, balance, and coherence activates reward pathways in the brain, producing pleasurable responses. These findings suggest that placement and compositional qualities of art—its scale, proximity, and relationship to the user's line of sight—can modulate emotional responses by engaging neural systems associated with reward and affect regulation.

3.4 Semiotics, Identity, and Social Meaning

Art in interiors also functions as a signifier of cultural identity, social belonging, and narrative meaning. Semiotic theories of art and design (Eco, 1989; Hall, 1997) emphasize how visual artifacts communicate values and affiliations. In contemporary interiors, artworks often extend beyond personal expression to embody organizational or communal identity. For example, corporate lobbies displaying regionally commissioned artworks signal cultural authenticity and commitment to local heritage, shaping both employee morale and visitor impressions (Kim & Heo, 2021). Similarly, public art integrated into residential complexes or shared spaces contributes to place-making, reinforcing a sense of belonging and continuity within a community (Carr et al., 1992). Placement thus becomes not only a visual but also a socio-cultural act, aligning interiors with collective narratives.

3.5 Functionalist Theories of Design and Material Integration

Functionalist design theory emphasizes the principle that form should follow function (Loos, 1910; Sullivan, 1896). In contemporary practice, however, function increasingly encompasses psychological comfort and sensory experience in addition to material performance. Integrating art into interiors as functional elements—such as acoustic panels, space dividers, or light installations—embodies this expanded functionalist ethos. Recent material science research demonstrates that aesthetically treated surfaces can perform technical roles, showing that art can solve pragmatic design challenges while simultaneously enhancing user experience. This integration blurs the boundary between utility and expression, aligning with current movements in sustainable and human-centered design.

3.6 Synthesis: Toward a Holistic Framework

Taken together, these theoretical foundations suggest a holistic framework for integrating art into contemporary interior design. Environmental psychology underscores art's restorative and stress-reducing potential; neuroaesthetics explains how aesthetic stimuli activate emotional and cognitive systems; semiotic theories highlight the communicative and identity-building functions of art; and functionalist perspectives illustrate the potential for art to serve as a technical solution. This synthesis positions art not merely as embellishment but as a critical component of interior environments that shapes perception, supports wellbeing, and enhances functional performance.

4. Mechanisms: How art placement affects emotion and behavior

4.1 Attention direction and wayfinding

Art functions as an orienting device. A visually strong piece establishes a focal point that organizes sightlines and circulation. In public interiors (airports, lobbies), well-placed art cues movement and reduces spatial ambiguity, which in turn reduces anxiety associated with unfamiliar spaces.

4.2 Emotional priming and atmosphere

Color, imagery, and thematic content prime moods. Warm palettes and figurative scenes can create sociable, cozy atmospheres in hospitality settings; cool palettes and abstract geometry can foster contemplative or corporate moods. The proximity of art to activity zones (e.g., calm art in patient rooms; dynamic art in a café) helps prime appropriate behavior.

4.3 Social meaning, identity, and belonging

Art communicates values and identity — from corporate artworks that encode brand narratives to community murals that assert local stories. In residential contexts, personal art sustains autobiographical meaning and psychological comfort; in communal spaces, curated art programs can cultivate collective belonging.

4.4 Biophilia and restorative imagery

Natural forms and representations have restorative properties. Where access to real nature is limited, artworks with natural motifs or organic compositions can provide partial restorative benefits implicated by the Kaplan framework and by outcomes like the Ulrich study.

4.5 Multimodal integration: sound, light, texture

Visual art rarely acts alone. *Integrated art* that connects to soundscapes (e.g., live music programs in airports), tactile installations, or lighting strategies creates multisensory contexts that have compounded psychological effects — calming, energizing, or orienting depending on combination.

5. Integrating art as a functional element — typologies and examples

Design practice increasingly employs art purposefully as functional material. The following typologies are illustrated by contemporary examples and product innovations.

5.1 Art as environmental conditioner

Noise control is a common functional challenge in restaurants, offices, and healthcare spaces. Acoustic art panels—custom-printed or sculpted sound-absorbing surfaces—combine imagery or decorative patterns with absorptive materials to reduce reverberation while contributing to visual identity. For example, *SoundFoundations* in India produces broadband absorbers with high-quality digital prints that appear like paintings yet function with lab-tested acoustic performance. Similarly, SPARKK Acoustic Wall Panels offer printed visuals, laser-cut or custom patterns, allowing designers to integrate texture, colour, and motif while also controlling sound. Other brands like Bajaj Acoutex

enable custom shapes, images, and finishes on PET or similar acoustical substrates so that the panel does not merely "disappear" but becomes part of the interior's expressive vocabulary. These models show that acoustic control and visual artistry need not be in tension but can be mutually reinforcing.

5.2 Art as partitioning and spatial definition

Large sculptural installations, wall murals, or hanging textile works can define zones without erecting walls — preserving openness while creating psychological separations (for privacy, quiet, or intimacy). This typology is employed in contemporary hospitality and co-working projects where flexibility and legibility are required.

5.3 Art integrated into furniture, fixtures and fittings

Designer makers increasingly blur lines between object and artwork. Leading contemporary designers (e.g., Patricia Urquiola) produce furniture that is simultaneously functional and artful, shaping comfort and spatial character through forms that are both ergonomic and sculptural. This approach converts everyday objects into focal artworks that also perform standard interior functions (seating, screens, light).

In the Indian context, the integration of art into furniture, fixtures, and fittings finds profound expression through craft-based design that merges function with ornamentation. Classical Indian sources do present art, drama and music as more than decoration: they are instruments for shaping emotions, achieving inner delight (ananda), purification of feelings (a form of catharsis), and restoring mental balance.

Traditional techniques such as bone and mother-of-pearl inlay, metal repoussé, carved woodwork, and veneer marquetry have been reinterpreted by contemporary designers to create furniture that serves utilitarian needs while doubling as sculptural focal points.

Makers like Mehul Art & Crafts and Prakash Handicraft of Rajasthan have revitalized bone inlay and silver-clad furniture, crafting consoles, chests, and mirrors that elevate everyday interiors through texture, reflection, and rhythmic patterning. Mysore-based Craft Melon revives the subtler tradition of wood inlay, blending classical motifs with modern silhouettes to suit contemporary tastes, while studios like Vikram Goyal's Viya employ repoussé metal panels and brass detailing to turn consoles and partitions into luminous works of art.

These examples illustrate how handcrafted furniture transcends decoration to embody cultural continuity, material integrity, and emotional depth—bringing human touch, narrative, and identity into spaces that might otherwise feel impersonal.

5.4 Art as interactive and digital functionality

Digital and interactive artworks serve as dynamic environmental controls, information displays, or participatory interfaces. Airports and cultural hubs now deploy curated digital installations to convey wayfinding, cultural narratives, and passenger wellbeing programming. Kempegowda International Airport Bengaluru (KIA) and the Museum of Art & Photography (MAP) have collaborated to create digital art museums in the domestic and international terminals of Terminal 2. This partnership showcases digital exhibitions of works by various artists, such as Jamini Roy and Jangarh Singh Shyam, and curated film displays from MAP's collection to provide a unique art experience for travelers.

5.5 Art for healing and wellbeing programs (curated collections)

Large healthcare systems have formal arts programmes to place and rotate visual artworks across clinical and public areas to support healing and employee wellbeing. The Cleveland Clinic's Arts & Medicine program is an institutional model that documents integration of visual arts, performances, and art therapy as a system-level strategy to support patients, families, visitors, and staff.

6. Case studies

6.1 Maggie's Centres — architecture, interior, and art for healing

Maggie's Centres (a UK network of free cancer care centres) intentionally marries architecture, interiors, and art to produce non-clinical, restorative environments. Each centre is designed with attention to daylight, natural materials, and homely interiors. Design of Maggie's Centres emphasize how architecture and interior design (including artful detailing) orchestrate calm, social connection, and psychological support for patients and families. Maggie's presents a strong model for how intentional design — where art and architectural form are co-constitutive — can shape therapeutic environments.

Fig 1. Maggie's Centre Manchester designed by Foster & Partners (Source: Dezeen, 2016).

https://www.dezeen.com/2016/04/27/norman-foster-partners-maggies-centre-cancer-care-manchester-england

Fig 2:Interior environment and patient experience at Maggie's Centres.
Source: The Telegraph (2016).
https://www.telegraph.co.uk/christmas/0/no-patient-should-told-wait-corridor-told-have-months-left-live/

6.2 Cleveland Clinic Arts & Medicine — systemic integration of art

The Cleveland Clinic's Arts & Medicine Institute curates a large collection (thousands of works), organizes rotating installations, and runs programs (art therapy, performances, artist residencies). Peer-reviewed descriptions and institutional reports document the program's scope and purpose — integrating art into clinical spaces as a strategic component of patient-centered care and staff wellbeing. The program illustrates how art placed in waiting rooms, corridors, and patient areas becomes a sustained system rather than a piecemeal aesthetic layer.

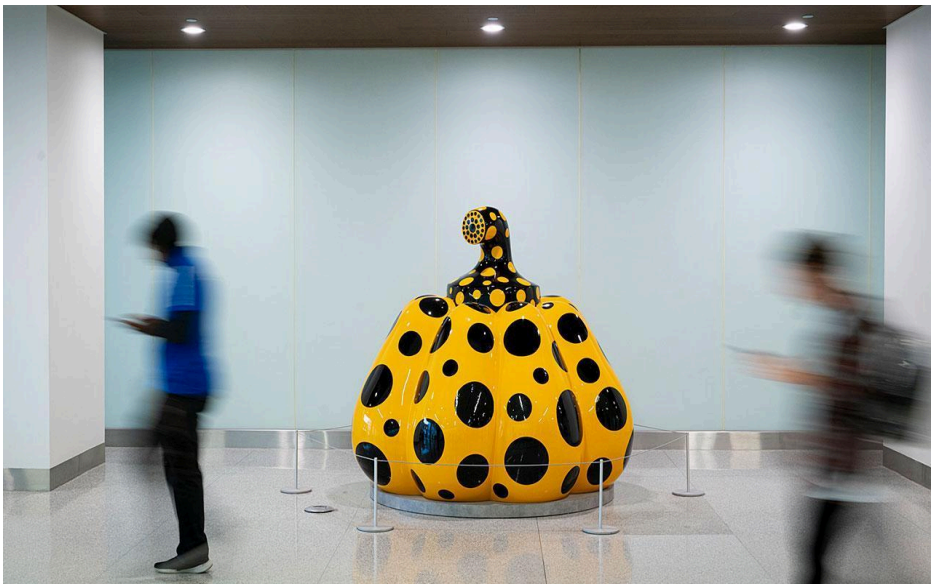

Fig 3: Yayoi Kusama, *Pumpkin* (2014), fiberglass-reinforced plastic and urethane paint. Collection of the Cleveland Clinic. Source: Cleveland Clinic Arts & Medicine.
https://my.clevelandclinic.org/patients/visitor-information/art-collection

6.3 Public art districts and airports — large-scale cultural placemaking

India's Lodhi Art District in New Delhi (an open-air public art district developed from 2015 onward) shows how large-scale murals in residential and civic fabric re-compose everyday urban experience, create local identity, and invite public interaction. Similarly, Indian airports have invested in art installations and cultural programming to improve traveler experience; recent partnerships show airports and cultural institutions collaborating to display curated South Asian art and live cultural performances, effectively turning transit spaces into cultural nodes that can reduce travel stress and offer restorative or identity-affirming experiences. These public examples demonstrate art's role beyond private interiors — as a functional amenity that calms, educates, and identifies place.

Fig 4: Public mural in the Lodhi Art District, New Delhi. Source: India Foundation documentation.

6.4 Acoustic art panels — productized functional art

Acoustic art panels produced by specialist acoustics firms combine printed imagery with absorptive cores to achieve measurable acoustic performance and visual customization. This commercial category provides designers with a pragmatic way to integrate art into environments that must also meet acoustic performance targets (conference rooms, learning spaces, eateries). These panels are a tangible example of art-as-functional building material.

In India, the integration of art into acoustic design reflects a growing synthesis of aesthetics, technology, and wellbeing.

Studios like Decibl Studio Gurugram, (https://deciblstudio.in/products) further personalize this approach with "acoustic paintings" — panels functioning as both decor and sound absorbers for residential and creative environments.

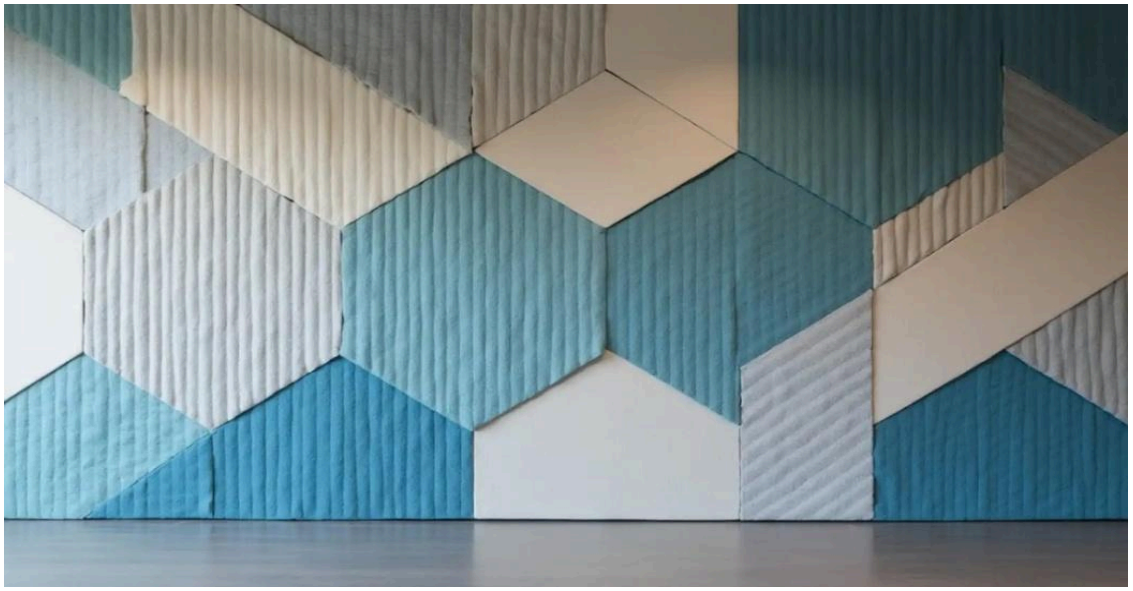

Fig 5: Example of acoustic art panels used in commercial design applications.
Source: Exiss Acoustics product documentation: https://exiss.ae/product/acoustic-panels/

6.5 Designer furniture and sculptural fittings — object-art as daily interface

While acoustic art panels illustrate how visual art can enhance environmental performance, the next frontier lies in designer furniture and sculptural fittings—where form, function, and emotion meet at the scale of touch and daily interaction.

In contemporary Indian interiors, furniture and fixtures increasingly operate as object-art, acting as tactile and psychological interfaces within lived space. Designers are reinterpreting traditional art vocabularies such as bone or brass inlay, wood carving, beaten metal, and textile weaving, merging them with modern ergonomics and structural precision.

https://themarwarexports.com/ https://casagold.in/collections/bone-inlay https://kalyanamfurniture.com/products/niksa-royale-solid-wood-brass-inlay-bedside-table

Fig 7: Inlay work used in traditional and contemporary Indian furniture design.

Studios like Viya by Vikram Goyal, Casegoods by Ashiesh Shah, and Rooshad Shroff Studio have pioneered this hybrid approach. Goyal's repoussé brass furniture and sculptural partitions transform metal into reflective, rhythmic surfaces that animate light and depth. Shah's minimalist stone and timber pieces introduce contemplative calm, while Shroff's embroidered teak and inlay collections

reinterpret craft processes as fine art within a functional frame. These pieces redefine furniture as sensorial sculpture—objects that influence posture, touch, and emotion as much as they serve practical needs. By embedding narrative and craftsmanship into usable form, these designers elevate everyday interaction into a multisensory experience—bridging artistry and utility in a distinctly Indian idiom.

7. Discussion: translating evidence into design practice

7.1 Design principles — placement, scale, and context

From the research and cases, several practical principles emerge:

1) Contextual fit: match artwork's scale, theme and intensity to the room's function (e.g., calming works in healthcare rooms; dynamic, identity-rich pieces in lobbies). Evidence from environmental psychology supports the idea that matched contexts produce better outcomes (reduced stress, improved attention).
2) Human scale & proportion: place works at comfortable sightlines; use larger works to anchor and smaller works for intimate encounters.
3) Prospect and refuge: consider seating orientation, daylight, and sightlines so the artwork and the room together produce restful prospect/refuge relationships.
4) Multisensory orchestration: combine visual art with acoustic control (acoustic panels), live music, or scenting strategically to maximize restorative or social effects (as documented in airport cultural programming and hospital arts programmes).

7.2 Functional integration and lifecycle concerns

When art performs functional roles (acoustic panels, partitions, lighting), designers should:

1) Specify performance metrics (e.g., NRC for acoustic panels), durability, maintenance, and cleaning regimes. Product suppliers typically publish technical specs and should be consulted early.
2) Plan for flexibility — modular art installations and rotateable programs (as done by institutional collections) preserve novelty and respond to evolving needs.
3) Attend provenance and ethics — especially for cultural or community artworks: commissions should involve stakeholder consultation and clear rights/maintenance agreements.

Practical implementation also requires consideration of cost and accessibility; high-quality commissioned artworks, custom acoustic installations, or curated programmes can be financially prohibitive for smaller institutions, underscoring the need for scalable, community-driven, or modular approaches that maintain both aesthetic and functional integrity.

7.3 Evaluation: measuring psychological impact

Designers and institutions should adopt mixed evaluation strategies:

1) Quantitative measures: validated wellbeing scales, stress biomarkers in clinical research, acoustic metrics for sound interventions. Seminal studies such as Ulrich's provide a model for rigorous comparison.
2) Qualitative feedback: interviews, diaries, and observation reveal meaning, identity, and subjective responses that numbers alone miss.
3) Operational metrics: wayfinding errors, queue times, or staff retention may reflect indirect effects of environmental art programs.

7.4 Emerging Technologies:

Looking ahead, emerging technologies are likely to reshape how art functions within interior environments. AI-curated rotating art systems offer the potential to dynamically adjust artwork based on seasonality, user profiles, behavioural patterns, or spatial activity levels, allowing interiors to remain emotionally responsive and culturally relevant without physical redesigns. Likewise, adaptive digital art environments—combining sensors, responsive lighting, projection systems, and generative imagery—can alter visual ambience in real time to support relaxation, stimulation, or wayfinding. These innovations extend the role of art from a static design element to a continuously evolving interface that can be programmed, personalised, and measured, opening new possibilities for evidence-based spatial wellbeing.

Figure 8: Immersive digital art environment (20 sqm) illustrating dynamic visual installations
Source: OneCraze Media documentation.
https://onecrazemedia.com/designing-immersive-digital-art-space-20sqm/

8. Limitations and research gaps

Despite the growing body of evidence linking art placement to psychological and functional outcomes in interior environments, research in this field still faces several limitations. Much of the existing knowledge is derived from case studies, institutional programmes, or anecdotal reports, with very few controlled or quasi-experimental studies conducted within real interior settings where variables such as circulation, lighting, and user behaviour can be systematically observed. As a result, causal relationships between specific art interventions and measurable outcomes remain difficult to establish.
Although Indian visual arts—such as folk murals, temple sculptures, and palace reliefs—are recognized for their aesthetic and cultural significance, research remains mostly descriptive, with limited focus on practical application. Few studies examine how motifs, spatial arrangements, and color palettes from these traditions can be systematically integrated into modern interiors or therapeutic spaces. Future work could develop design frameworks that draw inspiration from these forms, preserving cultural richness while enhancing emotional, psychological, and spatial well-being.
There is a need for mixed-method and longitudinal research designs that track changes in wellbeing, behaviour, and spatial performance over time, and for randomized or comparative studies where ethical and feasible.

Another persistent gap is the absence of standardized evaluation tools; without a common framework or metrics—such as a unified "space wellbeing index"—findings across projects remain difficult to compare or generalize.

Moreover, potential drawbacks—such as visual overstimulation, cultural misalignment, or unintended symbolic interpretations—should be acknowledged, as poorly selected or excessively intense artworks can heighten anxiety, overwhelm sensory comfort, or inadvertently alienate certain user groups.

Cross-cultural research has to be developed with reference to symbolic meaning, aesthetic preference, and emotional response which vary widely across cultures and communities. Deeper comparative studies are essential to understand how diverse populations interpret and benefit from art within interior spaces.

However, despite these limitations, emerging technologies present promising opportunities for advancing research in this field. In particular, digital sensing tools, such as biometric wearables, eye-tracking, affective computing, and spatial-behaviour sensors, offer new ways to measure emotional and cognitive responses to art in real interiors with far greater precision. These tools can enable real-time tracking of stress markers, attentional patterns, movement flows, and affective states, opening the possibility for data-rich, mixed-method studies that directly correlate art placement with measurable human outcomes.

9. Conclusion

This paper has explored the psychological and emotional impact of art placement in interior environments and the potential of integrating art as a functional design element in contemporary practice. The evidence presented across disciplines — from environmental psychology, neuroaesthetics, semiotics, and functionalist design theory — demonstrates that art in interiors exerts more than ornamental influence: it shapes mood, cognition, social belonging, and even physiological wellbeing.

Case studies in healthcare, workplaces, public cultural projects, and educational settings highlight that when art is intentionally curated and strategically placed, it not only elevates aesthetic quality but also produces measurable outcomes such as reduced stress, improved wayfinding, greater user satisfaction, and increased social interaction. Theoretical models such as Ulrich's stress reduction framework, Kaplan's attention restoration theory, and Chatterjee's aesthetic triad help explain why these effects occur, while applied design research shows how functional art (acoustic panels, sculptural partitions, artist-designed furniture) can resolve pragmatic challenges in sound control, space definition, or lighting while simultaneously enriching experiential quality.

The discussion also underscores that the effects of art are contingent: scale, placement, content, and contextual relevance determine whether an artwork calms or overwhelms, connects or alienates. Designers, therefore, must move beyond treating art as a "finishing touch" and instead approach it as a central element in evidence-based design strategies. For practitioners, this means collaborating with artists, psychologists, and material scientists early in the design process. For scholars, it suggests the need for more empirical studies that measure both psychological responses (stress biomarkers, attention levels, emotional states) and functional outcomes (acoustic performance, spatial navigation, social behavior).

In conclusion, art in interiors should be reconceptualized as both an emotional catalyst and a functional instrument. Such a reconceptualization bridges the gap between aesthetic enrichment and pragmatic necessity, offering a holistic design practice attuned to human wellbeing, cultural identity, and spatial performance. By integrating art as a deliberate, functional, and evidence-informed design element, contemporary interiors can move toward creating environments that are not only visually compelling but also psychologically restorative, socially meaningful, and materially efficient.

The future of research and practice in this domain lies in developing interdisciplinary frameworks that unite architecture, psychology, neuroscience, cultural studies, and engineering — frameworks that recognize art not as decoration but as an essential determinant of human experience in designed spaces.

References

Chatterjee, A. (2014). *The Aesthetic Brain*. Oxford University Press. https://global.oup.com/academic/product/the-aesthetic-brain-9780190262013

Chojnacki, B., et al. (2023). Sustainable perforated acoustic wooden panels: Acoustic performance and design implications. *Applied Sciences*. https://www.mdpi.com/1996-1944/16/18/6089

Cleveland Clinic Arts & Medicine. Institutional program pages and reports describing the collection and programming. https://my.clevelandclinic.org/departments/arts-medicine

Maggie's Centres. Architectural and healthcare design analyses on how architecture, interiors, and art contribute to therapeutic environments. https://architizer.com/blog/inspiration/collections/maggies-centres/

GIK Acoustics. Industry examples of printed acoustic art panels and technical product information. https://www.gikacoustics.com/collections/acoustic-art

Healing Environments: What Design Factors Really Matter According to Patients? (2016). Exploratory analysis of patient perceptions of interior design. https://pubmed.ncbi.nlm.nih.gov/27101834/

Iyendo, T. O., Uwajeh, P. C., & Ikenna, E. S. (2016). The therapeutic impacts of environmental design interventions on wellness in clinical settings: A narrative review. *Complementary Therapies in Clinical Practice*. https://daneshyari.com/article/preview/2628341.pdf

Kempegowda International Airport (Bengaluru) & Museum of Art & Photography (MAP). Example of airport-led cultural programming and digital art integration.

Kim, J., & Heo, W. (2021). Interior design with consumers' perception about art, brand image, and sustainability. *Sustainability, 13*(8), 4557. https://www.mdpi.com/2071-1050/13/8/4557

Madhubani Art: Indian Art Series — Bharti Dayal. This book provides a contemporary look at Madhubani painting (which historically included wall and floor murals in Mithila), blending traditional motifs with modern art practice.

Mikuni, J., et al. (2024). Art in the city reduces the feeling of anxiety, stress, and negative mood. (Urban public art and wellbeing study). https://uscholar.univie.ac.at/detail/o%3A2114613.pdf

Mukherji, P. D. (2001). *Citrasūtram — Viṣṇudharmottara Purāṇa (Kāṇḍa III, Chapters 35–43)*. Indira Gandhi National Centre for the Arts (IGNCA).

Painted Abode of Gods: Mural Traditions of Kerala — A. Ramachandran. This is a richly illustrated study of Kerala's mural-painting tradition in temples and palaces, exploring technique, iconography, and stylistic history.

Rao, S. (2012, September 18). *The art of painting in ancient India – Chitrasutra*. Sreenivasaraos.com.

Schreuder, E., Lebesque, L., & Bottenheft, C. (2016). Healing environments: What design factors really matter according to patients? *HERD Journal*. https://www.lowe-and-fletcher.co.uk/image/catalog/BLOG/schreuder-2016-healing.pdf

St+art India Foundation. Lodhi Art District documentation — public mural district and cultural placemaking. https://artsandculture.google.com/story/lodhi-art-district-st-art-india/EAWh787tb1GHJA

Stuckey, H. L., & Nobel, J. (2010). The connection between art, healing, and public health: A review of current literature. *American Journal of Public Health*. https://pmc.ncbi.nlm.nih.gov/articles/PMC2804629/

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*. https://www.science.org/doi/10.1126/science.6143402

Viṣṇudharmottara Purāṇa (Part III). (n.d.). *The Vishnudharmottara-Purāṇa* [PDF]. Archive.org.

Zeki, S., Bao, Y., & Pöppel, E. (2020). Neuroaesthetics: The art, science, and brain triptych. *Psych Journal*. https://pubmed.ncbi.nlm.nih.gov/32851817/

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Impact of Big Five Personality Traits on Collaborative Fashion Consumption of Delhi NCR Customers – An Extension of Theory of Planned Behavior.

ABSTRACT

This study investigates the psychological and behavioral determinants of Collaborative Fashion Consumption (CFC) in India by integrating the Theory of Planned Behavior (TPB) and the Big Five Personality Model (BFM). Using structural equation modelling (SEM) with path analysis on a sample of 400 respondents, the research examines the influence of attitude (CFCA), sustainable norms (SNCFC), perceived behavioral control (PBCCFC), and personality traits—openness, conscientiousness, extraversion, agreeableness, and neuroticism—on collaborative fashion consumption intention (CFCI) and its subsequent effect on behavior (CFCB). The model demonstrated excellent fit (χ^2 = 14.485, df = 6, GFI = .993, CFI = .996, RMSEA = .060) and explained 77.3% of variance in CFCI and 77.8% in CFCB. Results revealed that attitude, openness, agreeableness, and perceived behavioral control were strong predictors of intention, while sustainable norms enhanced intention but negatively influenced behavior directly, indicating a value–action gap. Intention emerged as the strongest determinant of behavior (β = .998), confirming TPB's central premise. The findings highlight the need for attitude-focused, accessible, and personality-aligned strategies to promote collaborative consumption in the Indian fashion sector, while recommending caution against over-reliance on normative pressure that may deter actual engagement.

Key Words: Collaborative Fashion Consumption, Theory of Planned Behavior (TPB), Big Five Personality Traits, Sustainable Fashion, Consumer Behavior in India, Path Analysis (SEM)

1. Introduction

Fashion is one of the most powerful cultural and economic fields and one of themost harmful to the environment, producing up to 8 percent of carbon emissions and generating a lot of textile waste across the world (Niinimäki et al., 2020). As the fast fashion trend has spread, clothing cycles have become shorter, which has contributed to the early disposal of apparels as well as unhealthy consumption habits (Ellen Macarthur Foundation, 2017).
It is on this background that Collaborative Fashion Consumption (CFC) including rental, swapping, and second-hand use has become a potential alternative to reduce the environmental impact of fashion and satisfy consumer wants in terms of variety and self-expression (Belk, 2007; Neerattiparambil & Belli, 2020a). Digitally and in fashion rental start-ups, CFC is becoming known in India, especially in metropolitan areas like Delhi NCR (Neerattiparambil & Belli, 2020a). Nevertheless, the rates of

adoption are not homogeneous and should be investigated further concerning psychological and social antecedents of CFC intention and behavior.

The Theory of Planned Behavior (TPB) (Ajzen, 1991) offers a highly effective model of examining the pro-environmental and consumption-related behaviors, including the influence of attitudes, subjective norms, and behavioral control. A continuation of TPB has been to add on dispositional and contextual variables to strengthen predictive ability in sustainability spaces (Han et al., 2010). The Big Five Personality Traits (McCrae & John, 1992) openness, conscientiousness, extraversion, agreeableness, and neuroticism have been identified as among these, and have been found to have a large effect on psychological dimensions that affect consumer decision-making, including sustainable apparel consumption (Del Fabbro, 2021; Ganesh Babu & Gupta, 2023). Recent research proposes that personality characteristics may be used to supplement TPB constructs to justify the difference in both Collaborative Fashion Consumption Intention (CFCI) and Collaborative Fashion Consumption Behavior (CFCB) (Ganesh Babu & Gupta, 2023)
The empirical results of this study, which centre around consumers in Delhi NCR, indicate that openness, agreeableness, extraversion, and collaborative fashion attitudes have a significant predictive power on CFCI, but conscientiousness and neuroticism have minimal effect. Moreover, behavior is highly predicted by intention, which supports the main idea of TPB. Interestingly, the effect of sustainable norms is dual: although it has a positive correlation with CFCI, it has a negative direct impact on CFCB, and there is a potential mismatch between normative pressure and actual adoption. The findings indicate how significant it would be to incorporate personality frameworks in TPB-based models to address the multifaceted interaction between psychological and situational elements in the changing fashion consumption environment in India.

1.1 Research Gap

Although the idea of collaborative fashion consumption (CFC) as an alternative to fast fashion is becoming increasingly popular among researchers, the majority of the literature has focused on developed markets, and not much empirical data have been collected in developing markets like India(Belk, 2007; Niinimäki et al., 2020). The Indian context is the area where renting intentions and online collaborative platforms have been studied extensively (Neerattiparambil & Belli, 2020b; Parguel et al., n.d.), although they rarely incorporate the aspects of individual personality differences into the set of behavioral provisions. Moreover, although the Theory of Planned Behavior (TPB) has been extensively used to explain consumption behavior associated with sustainability, it is occasionally limited in explaining such behavior due to the omission of consistent dispositional variables such as personality traits (Ajzen, 1991). This is an essential omission because personality characteristics determine consumer perceptions of social norms, control perceptions, and decision-making in regard to new consumption paradigms such as fashion renting and swapping(Ganesh Babu & Gupta, 2023; Han et al., 2010)

The other gap is the intention-behavior gap that is often documented in sustainable consumption research, where consumers are reported to be having strong intentions to act pro-sustainably but they do not do so (White et al., 2019).Our initial results support this difficulty, with sustainable norms having a positive effect on intention and a negative effect on behavior suggesting that normative pressures can unintentionally slow actual adoption. To resolve the contradictions, it is necessary to augment TPB with personality variables to account more effectively the variance in behavior, especially that of urban Indian consumers in Delhi NCR, where fashion consciousness and

sustainability awareness is increasing.

1.2 The objectives of the research will be as follows:

1. To investigate the role of attitudes, social norms and perceived behavioral control on collaborative fashion consumption intention.
2. To examine how the Big Five Personality Traits (openness, conscientiousness, extraversion, agreeableness, neuroticism) may predict collaborative intention to consume fashion.
3. To examine how intention impacts on collaborative fashion consumption behavior and to examine the mediating impact of intention.
4. To deliver information on the management of the intention behavior gap in the collaborative fashion consumption among consumers in Delhi NCR.

In helping to answer such objectives, the study not only makes extensions to TPB by means of the incorporation of personality traits, but also gives context-specific support to a high-potential yet unexplored market, thus contributing positively towards the theoretical and practical insights into collaborative fashion consumption.

2 Review of Literature

2.1 Theory of Planned behavior

Ajzen (1985) developed the Theory of Planned Behavior (TPB), a psychological framework for understanding and forecasting human behavior. It adds a third element to the previously established Theory of Reasoned Action (TRA). Personal assessment of the conduct, whether favorable or unfavorable, is the definition of attitude(Iran et al., 2019). The perceived societal pressure to engage in or refrain from engaging in a behavior is known as social norms. Like self-efficacy, Perceived Behavioral Control (PBC) refers to an individual's belief about how easy or difficult it is to perform a specific behavior(Iran et al., 2019; Mustofa & Setiawan, 2022). If individuals perceive many supporting factors and few obstacles, they are more likely to find the behavior easy to perform (Mustofa & Setiawan, 2022). The best indicator of actual conduct is behavioral intention, which is influenced by these three factors(Iran et al., 2019). It has been demonstrated that TPB offers a trustworthy paradigm for empirical research on determining behavioral intention and causes of behavior. The TRA and TPB are overwhelmingly supported by empirical academic research. Researchers have been confident utilizing this model to examine consumer behavior in a variety of study contexts, including sustainability, as a number of published research reports show that altering TPB variables can alter the real behavior(McCoy et al., 2021; Mustofa & Setiawan, 2022), and hence it was decided to extend the TPB with Big Five Personality Model, the following hypothesis are proposed.

Hypothesis 1: Consumers with a more positive attitude toward collaborative fashion consumption will have a higher intention to engage in such practices.

Hypothesis 2: Stronger perceived social pressure will positively influence consumers' intention to adopt collaborative fashion consumption.

Hypothesis 3: Greater perceived control over collaborative fashion consumption will positively predict intention to engage in it.

2.2 Big Five Personality traits

According to the APA Dictionary of Psychology, a personality trait is “A relatively stable, consistent, and enduring internal characteristic that is inferred from a pattern of behaviors, attitudes, feelings, and habits in the individual.”(Robert R. & Paul T., 2008). The well-known "big five" aspects of personality—extraversion, agreeableness, conscientiousness, emotional stability/neuroticism, and culture (later used by researchers as openness)—were the product of Norman's groundbreaking research in 1963(Saran et al., 2016). Conscientiousness (goal oriented), extraversion (social interaction and emotional stability), agreeableness (compassion and caring), openness to experience (openness to new ideas and new ways of doing things), and emotional stability (coping with negative emotion) are the five categories that encompass all the traits that define human personality(Saran et al., 2016).

Research has examined the relationship between personality and consumer behavior from a variety of angles, including the decision-making process as a whole, emotional experiences, and purchase intentions. It was discovered that different personality types responded to marketing stimuli in different ways(Saran et al., 2016).

Hypothesis 4: Consumers high in openness to experience will show stronger intentions toward collaborative fashion consumption.

Hypothesis 5: Consumers high in conscientiousness will exhibit stronger collaborative fashion consumption intentions.

Hypothesis 6: Extraverted consumers will show stronger intentions to participate in collaborative fashion consumption.

Hypothesis 7: Agreeable consumers will have stronger collaborative fashion consumption intentions.

Hypothesis 8: Neuroticism will negatively predict intention to engage in collaborative fashion consumption.

2.3 Collaborative Fashion Consumption (CFC) Attitude, Intention and Behavior

CFC is defined as a consumption trend where consumers have access to pre-existing clothing instead of purchasing new items, either through sharing, lending, renting, or leasing fashion items owned by others or through alternative means of acquiring individual ownership (gifting, swapping, or secondhand)(Iran et al., 2019). Alternative business models frequently rest on the notion that materials and goods move in a circular fashion throughout both the manufacturing and consumption stages (Gullstrand Edbring et al., 2016).

Intention and attitude are shaped by personal traits like lifestyle, self-concept, and consumption habits, and Varies with Products (Gullstrand Edbring et al., 2016; Shetu et al., 2025). Younger consumers are drawn to second-hand fashion for affordability and novelty, but may not perceive it as high-quality or unique. Attitudes and intentions vary across countries and cultures. Urban consumers show more engagement due to better access to CFC infrastructure(Shetu et al., 2025). Consumers are crucial to the success of CFC business models, but their acceptance depends on familiarity, trust, and perceived value (Gullstrand Edbring et al., 2016).

Hypothesis 9: Collaborative Fashion Consumption Intention will have a positive effect on Collaborative Fashion Consumption Behaviour.

Hypothesis 10: Subjective Norms will have a direct effect on Collaborative Fashion Consumption Behaviour.

3. Methodology

3.1 Research Design

In this study, a quantitative, cross-sectional study design was employed through structural equation modelling (SEM) path analysis to assess how psychosocial and personality-based factors affected Collaborative Fashion Consumption Intention (CFCI) and its effects on Collaborative Fashion Consumption Behavior (CFCB). The integrated conceptual model has incorporated both the Theory of Planned Behavior (TPB) (Ajzen, 1991) and the Big Five Personality Model (BFM) (McCrae and John, 1992) constructs and permitted a thorough analysis of attitudinal, normative, control-related, and personality-based determinants.

3.2 Sample and Data Collection

Gen Y and Gen Z consumers residing in Delhi NCR, were chosen as the target customers. Gen Z are more fashionable than GenY (Clifton Mark, 2024b) and hence both the category was included in the Sample. The sampling strategy employed was non-probability convenience sampling using an online survey distributed via social media and personal networks. This was appropriate for reaching a demographic active in digital consumption and fast fashion. A total of 619 responses were collected, of which 400 were deemed valid and usable after screening for completeness and relevance. The sample size was found to be sufficient as per the structural equation modeling (SEM) guidelines, a sample size of 5–10 times the number of measurement items is adequate(Weston & Gore, 2006).

3.3 Measurement Instruments

The survey instrument was structured into ten sections, each designed to measure one of the study's key latent variables: Personality trait Openness (PTO), Personality trait Conscientiousness (PTC), Personality trait Extraversion (PTE), Personality trait Agreeableness (PTA), Personality trait Neuroticism (PTN), Perceived Behavioral Control Collaborative Fashion Consumption (PBCCFC), Subjective Norms Collaborative Fashion Consumption (SNCFC), Collaborative Fashion Consumption Attitude (CFCA), Collaborative Fashion Consumption Intention (CFCI), Collaborative Fashion Consumption Behavior (CFCB)

All items were measured using validated scales adapted from prior literature to ensure reliability and construct validity. Specifically, Personality trait Openness (PTO), Personality trait Conscientiousness (PTC), Personality trait Extraversion (PTE), Personality trait Agreeableness (PTA), Personality trait Neuroticism (PTN) all adopted from (Farid et al., 2018)., Perceived Behavioral Control Collaborative Fashion Consumption (PBCCFC) adopted from(Amanda & Marsasi, 2024; Mustofa & Setiawan, 2022). Subjective Norms Collaborative Fashion Consumption (SNCFC), Collaborative Fashion Consumption Attitude (CFCA) adopted from (Ayob & Mohamed Makhbul, 2020; Duong, 2022; Ganesh Babu & Gupta, 2023). Collaborative Fashion Consumption Intention (CFCI) and Collaborative Fashion Consumption Behavior (CFCB) adopted from (Iran et al., 2019)Each item was measured on a five-point Likert-type scale, designed to capture agreement, frequency, or likelihood, depending on the construct.

3.4 Data Analysis Procedure

Data were screened for missing values, outliers, and normality prior to SEM estimation using AMOS 24.0 with maximum likelihood estimation. Model fit was assessed using multiple indices: Chi-square (χ^2 = 14.485, df = 6, p = .025), Goodness-of-Fit Index (GFI = .993), Adjusted GFI (AGFI = .935), Comparative Fit Index (CFI = .996), Tucker–Lewis Index (TLI = .968), Root Mean Square Error of Approximation (RMSEA = .060). The model explained 77.3% of variance in CFCI and 77.8% in CFCB, indicating excellent explanatory power.

4. Results

4.1. Exploratory Factor Analysis

The results of the Exploratory Factor Analysis (EFA) indicate that the data were highly suitable for factor analysis, as evidenced by the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (.925), which exceeds the recommended threshold of .80, and Bartlett's Test of Sphericity (χ^2 = 14410.592, df = 2346, p < .001), which confirmed the presence of sufficient correlations among variables. Using Maximum Likelihood extraction with Promax rotation, ten factors were retained based on eigenvalues greater than 1 and theoretical interpretability, explaining 52.04% of the cumulative variance after rotation. The factor structure demonstrated strong and meaningful loadings across constructs, including Personality trait Openness (PTO), Personality trait Conscientiousness (PTC), Personality trait Extraversion (PTE), Personality trait Agreeableness (PTA), Personality trait Neuroticism (PTN), Collaborative Fashion Consumption Attitude (CFCA), Collaborative Fashion Consumption Intention (CFCI), Collaborative Fashion Consumption Behavior (CFCB), Perceived Behavioral Control for CFC (PBCCFC), and Subjective Norms towards CFC (SNCFC). Most items loaded above the acceptable threshold of 0.5, with minimal cross-loadings, supporting construct distinctiveness. The graphical representation of the proposed model is presented as Figure 1.

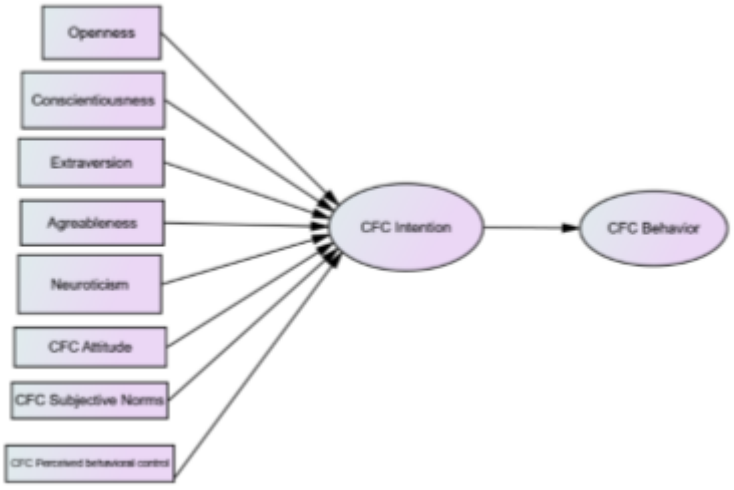

Fig 1: Theoretical Model

4.2. Reliability and Validity

Internal consistency reliability was confirmed with Cronbach's alpha values ranging from 0.703 (CFCA) to 1.172 (PTE), all exceeding the recommended threshold of 0.70 (Nunnally & Bernstein, 1994). Composite reliability (CR) values ranged between 0.76 and 1.01, indicating strong construct reliability. Average Variance Extracted (AVE) values for most constructs were above 0.50,

demonstrating adequate convergent validity, except for a few personality constructs (e.g., PTC, PTN) which exhibited marginally lower AVE values (~0.46–0.48), yet were retained given their theoretical relevance and satisfactory CR (>0.70).

4.3 Confirmatory Factor Analysis

Following EFA, Confirmatory Factor Analysis (CFA) was conducted using AMOS (v18) to validate the measurement model and assess its reliability, convergent validity, and discriminant validity. The graphical representation of CFA, the final calculated model, is shown in Figure 2.

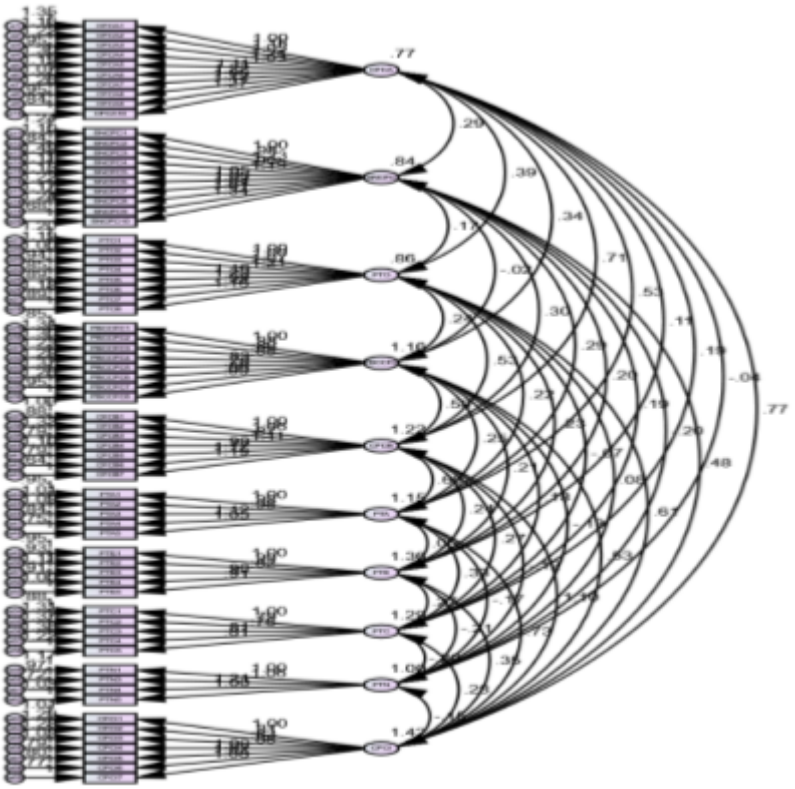

Fig 2: Confirmatory Factor Analysis

The measurement model was evaluated with the help of confirmatory factor analysis (CFA) to investigate the reliability and validity of constructs considered in the research. All items had standardized factor loadings of between 0.559 and 0.854 (Table 1), which surpasses the advised 0.50 minimum factor loadings to achieve indicator reliability (Hair, 2009). Cronbach alpha (0.783-0.908) and composite reliability (CR) (0.785-0.909) were found to be within the range of 0.70 used to determine internal consistency reliability, indicating the results were confirmable through content validity and internal consistency reliability (Fornell et al., 1981). Most of the constructs received convergent validity with averaged variance extracted (AVE) scores ranging between 0.424 and 0.591 with few exceptions (e.g., PTC, PBCCFC, SNCFC, CFCA) that were slightly lower than 0.50 but were important in the conceptual framework (Hair, 2009)). Maximum shared variance (MSV) values were between appropriate limits and this indicated that there was discriminant validity.

Table 1: Results of Measurement Model					
Variable/ Construct	**Items**	**Standardized Factor Loading**	**Cronbach's Alpha**	**CR**	**AVE**
PTO	PTO1	0.647	0.891	0.892	0.509
	PTO2	0.65			
	PTO3	0.705			
	PTO4	0.759			
	PTO5	0.76			
	PTO6	0.771			
	PTO7	0.647			
	PTO8	0.753			
PTC	PTC1	0.772	0.783	0.785	0.424
	PTC2	0.619			
	PTC3	0.592			
	PTC4	0.618			
	PTC5	0.64			
PTE	PTE1	0.768	0.854	0.855	0.541
	PTE2	0.767			
	PTE3	0.671			
	PTE4	0.741			
	PTE5	0.727			
PTA	PTA1	0.739	0.866	0.867	0.566
	PTA2	0.721			
	PTA3	0.709			
	PTA4	0.796			
	PTA5	0.793			
SNCFC	SNCFC 1	0.636	0.896	0.897	0.468
	SNCFC 2	0.649			
	SNCFC 3	0.776			
	SNCFC 4	0.559			
	SNCFC 5	0.719			
	SNCFC 6	0.67			
	SNCFC 7	0.661			
	SNCFC 8	0.661			
	SNCFC 9	0.641			
	SNCFC 10	0.83			
PTN	PTN1	0.679	0.822	0.823	0.539
	PTN3	0.733			
	PTN4	0.817			
	PTN5	0.7			
CFCA	CFCA1	0.602	0.896	0.897	0.466

	CFCA2	0.683			
	CFCA3	0.641			
	CFCA4	0.736			
	CFCA5	0.62			
	CFCA6	0.666			
	CFCA7	0.72			
	CFCA8	0.637			
	CFCA9	0.727			
	CFCA10	**0.773**			
CFC I	CFCI1	0.764	0.897	0.898	0.559
	CFCI2	0.649			
	CFCI3	0.656			
	CFCI4	0.711			
	CFCI5	0.803			
	CFCI6	0.805			
	CFCI7	0.826			
CFCB	CFCB1	0.731	0.908	0.909	0.591
	CFCB2	0.782			
	CFCB3	0.64			
	CFCB4	0.809			
	CFCB5	0.72			
	CFCB6	0.825			
	CFCB7	0.854			
PBCCFC	PBCCFC1	0.76	0.858	0.859	0.435
	PBCCFC2	0.636			
	PBCCFC3	0.632			
	PBCCFC4	0.648			
	PBCCFC5	0.619			
	PBCCFC6	0.585			
	PBCCFC7	0.638			
	PBCCFC8	0.739			
Model Fitness: X2 = 2675.977, df=2232, X2/df = 1.199, RMSEA =0.022, RMR =0.083, CFI =0.966 , GFI =0.856					

The model fitted the results very well: 2675.977/2232 = 1.199, 0.022/0.083 = RMSEA/RMR, 0.966/0.856 = CFI/GFI. These values are indicative of a good-fitting model using the conventional cut-off values(Hu & Bentler, 1999), with RMSEA of less than 0.05, and CFI of more than 0.95 indicating a good fit, and GFI, though a bit lower than 0.90, still acceptable in complex models with many observed variables. In this way, the measurement model is sufficient to reflect the underlying constructs of collaborative fashion consumption, which would justify its application in the further analysis of the structure.

4.4 Discriminant validity

The square root of the average variance extracted (AVE) of each construct (diagonal values) was used to evaluate discriminant validity in comparison with the correlations of the constructs with others (off-diagonal values). As indicated in the matrix, CFCI = 0.748, CFCB = 0.769, and CFCA = 0.683 diagonal values were always greater than their corresponding inter-construct correlations, which indicates sufficient discriminant validity between the constructs.

As an example, the square root of AVE of CFCI (0.748) was larger than the maximum correlation to CFCB (0.833) and CFCA (0.683) and lower than that of SNCFC (0.360) and PTO (0.480). Some of the correlations (e.g., CFCI-CFCB = 0.833) were also quite high, but still, they were no higher than the diagonal values, hence satisfying the discriminant validity criterion. These findings confirm that the constructs measure different aspects of collaborative fashion consumption without significant overlaps and it is reasonable to conclude that the measurement model was suitable to be used in further structural analysis and exceeded its inter-construct correlations.

4.5 Path Analysis and Hypothesis Testing

In this study, the Theory of Planned Behavior (TPB) (Ajzen, 1991) and the Big Five Personality Model (BFM) (McCrae & John, 1992) is integrated to explore the determinants of Collaborative Fashion Consumption Intention (CFCI) and its relationship with Collaborative Fashion Consumption Behavior (CFCB). The model explains 77.3% of the variance in intention and 77.8% in behavior—demonstrating the combined strength of these theoretical perspectives in explaining sustainable fashion consumption in India.

Table 2: Fornell & Larcker Criterion for discriminant validity

	PTN	CFCA	SNCFC	PTO	PBCCFC	CFCB	PTA	PTE	PTC	CFCI
PTN	**0.734**									
CFCA	-0.048	**0.683**								
SNCFC	-0.219	0.360	**0.684**							
PTO	0.090	0.480	0.201	**0.713**						
PBCCFC	-0.125	0.356	-0.016	0.241	**0.660**					
CFCB	-0.111	0.728	0.300	0.518	0.486	**0.769**				
PTA	-0.163	0.569	0.295	0.221	0.220	0.579	**0.752**			
PTE	-0.177	0.107	0.190	0.209	0.169	0.185	0.047	**0.736**		
PTC	-0.178	0.187	0.179	-0.062	0.145	0.216	0.274	0.201	**0.651**	
CFCI	-0.129	0.739	0.437	0.554	0.416	0.833	0.570	0.248	0.209	**0.748**

4.5.1 Attitudinal Drivers

CFCA (attitude) was the strongest predictor of intention(β = .518), demonstrating that positive evaluation of collaborative fashion—its cost savings, novelty, or sustainability benefits—significantly influences intention. Conforming to TPB's assertions. This aligns with prior evidence where attitude emerged as a robust predictor of sustainable fashion intentions among Gen Z (e.g., apparel rental adoption) (Becker-Leifhold, 2018; McCoy et al., 2021).
The results imply that positive sentiments on collaborative fashion consumption (CFC) among Delhi

NCR consumers can be strengthened by promoting pride, trendiness, and environmental responsibility through influencer-led initiatives, social media, and storytelling.

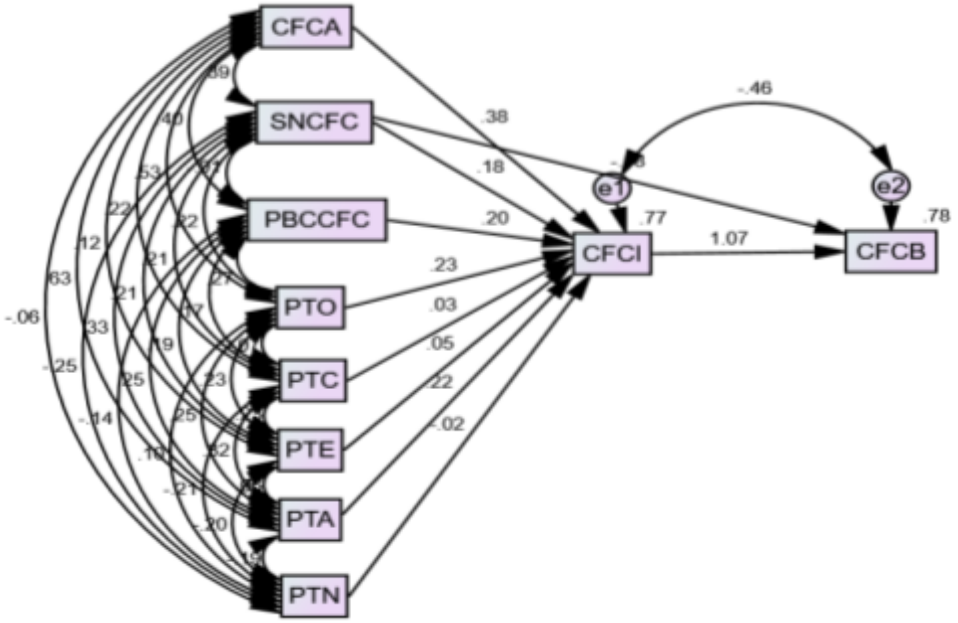

Fig 3: Path Analysis

Table 3: Hypothesis testing Results

Hypothesis	Path Estimate	Estimate (β)	Std. Estimate (β)	t-value (CR)	p-value	Decision	Relevant R^2
H1	CFCA → CFCI	0.518	0.378	11.115	*** (< 0.001)	**Accepted**	R^2 (CFCI) = 0.773
H2	SNCFC → CFCI	0.238	0.181	5.234	*** (< 0.001)	**Accepted**	R^2 (CFCI) = 0.773
H3	PBCCFC → CFCI	0.222	0.195	4.876	*** (< 0.001)	**Accepted**	R^2 (CFCI) = 0.773
H4	PTO → CFCI	0.295	0.227	6.298	*** (< 0.001)	**Accepted**	R^2 (CFCI) = 0.773
H5	PTC → CFCI	0.033	0.029	1.228	0.220	**Rejected**	R^2 (CFCI) = 0.773
H6	PTE → CFCI	0.055	0.052	2.189	0.028	**Accepted (weak)**	R^2 (CFCI) = 0.773

H7	PTA → CFCI	0.247	0.216	6.045	*** (< 0.001)	**Accepted**	R^2 (CFCI) = 0.773
H8	PTN → CFCI	–0.029	–0.023	–0.993	0.322	**Rejected**	R^2 (CFCI) = 0.773
H9	CFCI → CFCB	0.998	1.072	18.542	*** (< 0.001)	**Accepted**	R^2 (CFCB) = 0.778
H10	SNCFC → CFCB (Direct)	–0.218	–0.178	–4.356	*** (< 0.001)	**Accepted (negative)**	R^2 (CFCB) = 0.778

4.5.2 Normative Influences

Subjective norms (SNCFC), negatively impacted behavior negatively (β = -.218) but positively impacted intention (β =.238). Normative pressure can increase intention but unintentionally hamper actual uptake because of reactance or perceived moral imposition as supported by previous studies (Ajzen, 1991). Guilt-based messaging should be avoided and normative appeals, such as relatable leaders and community narratives, can help Indian consumers connect intention and conduct without creating negative reactions.

4.5.3 Perceived Behavioral Control

Intention was significantly predicted by perceived behavioral control (PBCCFC) (β =.222), supporting TPB's hypothesis that behavioral intention is influenced by perceived ease and self-efficacy (Ajzen, 1991). In order to increase perceived feasibility and uptake, Collaborative fashion platforms in India must prioritise convenience, trust-building, multilingual accessibility, and efficient logistics.

4.5.4 Personality trait

In the personality dimension, agreeableness (β =.247) and openness (β =.295) were significant predictors of intention, while extraversion (β =.055) had a minor but positive effect. These findings align with the Big Five's depiction of openness as curiosity and readiness for innovation, extraversion as social orientation, and agreeableness as empathy and teamwork(McCrae & John, 1992). However, there was no discernible difference between neuroticism and conscientiousness. Interactive, community-focused, and technologically creative marketing strategies are necessary to appeal to curious, socially concerned individuals, especially urban millennials and Gen Z.

4.5.5 Intention–Behavior Link

TPB's claim that intention is the nearest predictor of conduct, given no external barrier interference, is reinforced by the remarkably strong path from intention to behavior (β =.998) (Ajzen, 1991). As the CFC sector is in its nascent stage in India it is important to devote resources to strategies that convert intention into tangible action, such as trial initiatives, loyalty rewards, and ease-of-entry models.

Table 3 and Figure 3 indicate that the strongest positive impact on intention was by attitude toward collaborative fashion consumption (CFCA) (= 0.378, $p < .001$), as stated in TPB that positive attitudes enhance behavioral intentions. Intention was also positively affected by sustainable norms (SNCFC, 0.181, $p < 0.001$) and perceived behavioral control (PBCCFC, 0.195, $p < 0.001$) which was reflective of the fact that it was important to establish the existence of social pressure and the sense of

ease to strengthen sustainable behaviors (Ajzen, 1991). Among personality factors, the intentions were positively predicted by openness (PTO, β = 0.227, p < .001), agreeableness (PTA, 0.216, p = .001), and extraversion (PTE, 0.052, p = .028), whereas the role of conscientiousness (PTP) and neuroticism (PTN) were not significant. The intention-behavior relationship was most significant (CFCI → CFCB, 1.072, p <.001), which can be supported by the TPB assumption that intention is the closest predictor of behavior. Nevertheless, sustainable norms had a strong negative direct impact on behavior (β = -0.178, p <.001) even though they positively affected intention, which indicates a potentially competitive mediation or suppressing effect, with too high normative expectations potentially suppressing real involvement (White et al., 2019).

Among the ten hypotheses that were tested, 8 were confirmed: H1, H2, H3, H4, H6, H7, H9 and H10. Two (H5: PTC -> CFCI, H8: PTN -> CFCI) hypotheses were rejected because their paths were not significant. These results highlight the central roles of attitude, social norms, perceived control and chosen personality factors (openness, agreeableness, extraversion) in supporting collaborative consumption intentions and the insignificant role of conscientiousness and neuroticism in this behavioral context.

5. Discussion

The path analysis strongly supports the proposed model that integrates Theory of Planned Behavior (TPB) and Big Five Personality Model to explain the CFC dynamic in Delhi NCR India. The model predicted 77.3% variance in CFC intention (CFCI) and 77.8% in CFC behavior (CFCB). This surpassed the model's predictive power proposed in similar studies (McCoy et al., 202). Attitude toward collaborative fashion consumption (CFCA) is the most influential predictor of intention (β = 0.378, p < 0.001), aligning with TPB's central theme that positive evaluations lead to stronger behavioral intentions.

Sustainable norms (SNCFC) and perceived behavioral control (PBCCFC) positively affect intention (β = 0.181 and β = 0.195, respectively, p < 0.001), supporting the role of social expectations and perceived ease in shaping willingness to adopt collaborative fashion, contradicting a previous study, which found that the PBC was a non-significant influencer. Personality traits exerted varying influences: openness (β = 0.227) and agreeableness (β = 0.216) significantly and positively predicted, extraversion (β = 0.052), a meaningful yet weak prediction (p = 0.028). Conscientiousness and neuroticism did not significantly predict, stating that traits linked to rule-following or emotional instability do not meaningfully impact intention formation in this context.

These relations were also more nuanced by personality traits. There were high positive effects of openness (PTO) and agreeableness (PTA), whereas extraversion (PTE) had a smaller but statistically significant effect on intention. Such results imply that imaginative, sociable, and cooperative consumers are more inclined to collaborative fashion models, which is consistent with the earlier literature that associates the characteristics with pro-environmental behavior (Lee & Huang, 2020). On the other hand, conscientiousness (PTC) and neuroticism (PTN) did not play a significant role implying that being systematic or emotionally unstable does not always lead to collaborative consumption.

One of the most striking findings is the significant path intention-behavior (= 1.072) which is a strong indication of one of the fundamental arguments of TPB, namely, intention is the nearest predictor of actual behavior. Nonetheless, the negative impact of sustainable norms on behavior (β = -0.178) makes this relation more complex. Though norms have a positive effect on intention, their direct effect on behavior was inhibitory, which is indicative of possible intention-behavior distance due to over-normative pressure or perceived social enforcement(White et al., 2019b). This is in line with

research reporting that high normative cues can be counterproductive as they are seen as restraining and because resisting or disengaging instead of engaging voluntarily can occur.

Practically speaking, these results have serious implications on marketers and policymakers in India where collaborative fashion is gaining traction among younger age groups and particularly Gen Z that have been reported to be more fashion-conscious compared to Millennials(Clifton Mark, 2024a). Instead of guilt-inducing or prescriptive campaigns that seek to change attitudes through positive intentions, campaigns should be centered on creation of positive attitudes based on aspirational or lifestyle-driven messages. Intention may also be reinforced by the sequence of improving platform usability, accessibility, and trust mechanisms that further increase perceived behavioral control. Also, it ought to exploit the psychological orientations of the open and agreeable consumer by developing the community-based fashion sharing platform, campus activation, and influencer collaboration that attracts creativity and social bonding. Meanwhile, policymakers must not be overly guided by normative appeals since these will inadvertently impede actual engagement regardless of providing positive attitudes.

6. Conclusion, Limitations and Recommendations

The extension of TPB with Big Five Personality model (BFM) explains that Collaborative Fashion

consumption is affected by contextual and psychological elements. The results undoubtedly show that while intention is the main factor influencing actual action, attitudes, perceived behavioral control, and personality factors like agreeableness and openness are powerful factors for increasing the intention to consume collaborative fashion. Intention and sustainable norms predict intention and its impact on behavior. The structural equation model suggests that campaigns should focus on aspiration and positive storylines, establish smooth paths for participation and develop engagement models that are driven by the community. Platforms if it offers simplicity, openness and culturally appropriate experiences, would lead to greater the intention - behavior GAP among Customers in Delhi NCR.

Although this research provides important results on the factors of collaborative fashion consumption intention (CFCI) and behavior (CFCB) in the Indian context, there are several limitations that must be admitted. To begin with, there was a cross-sectional design of data collection, which limits the ability to make unquestionable causal conclusions about how the predictors (e.g., attitude, sustainable norms, perceived behavioral control, personality traits) influence the observed behaviors. Longitudinal or experimental designs would be useful in proving the causality in time and confirming the strength of these relationships with time. Second, constructs were measured relying mostly on self-reported information that can be socially desirability biased, and thus clouds judgments of perceptions (especially concerning sustainability-related studies where respondents are likely to respond with exaggerated eco-conscious intents).

Future studies should consider multi-method solutions, which combine behavioral tracking (e.g., records of rental services usage) or implicit sustainability attitude measures, to diminish self-reporting. Also, though this research explored the contribution of big five traits of personality, other pertinent psychological variables, including materialism, hedonic motivation, or environmental concern, were not incorporated, which could further specify the predictive model of collaborative fashion adoption. This study may be extended to various demographic categories and geographical settings across India to improve the generalizability of the study as collaborative fashion platforms infiltrate rural and semi-urban markets. Lastly, moderating variables like income level, digital literacy, and cultural

dimensions may be examined in future studies and may potentially affect the intensity of the intention (behavior) relationship in developing economies.

References

Ajzen, I. (1991). The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211.

Amanda, T. A., & Marsasi, E. G. (2024). Exploration of Perceived Behavioral Control and Intention to Purchase to Increase Actual Behavior. Image : Jurnal Riset Manajemen, 12(1), 14–30. https://doi.org/10.17509/IMAGE.2024.002

Ayob, A. H., & Mohamed Makhbul, Z. K. (2020). The effect of personality traits on collaborative consumption participation. Malaysian Journal of Society and Space, 16(2). https://doi.org/10.17576/geo-2020-1602-16

Becker-Leifhold, C. V. (2018). The role of values in collaborative fashion consumption - A critical investigation through the lenses of the theory of planned behavior. Journal of Cleaner Production, 199, 781–791. https://doi.org/10.1016/j.jclepro.2018.06.296

Belk, R. (2007). Why not share rather than own? Annals of the American Academy of Political and Social Science, 611(1), 126–140. https://doi.org/10.1177/0002716206298483

Ch Andreas Hinterhuber, & Graduand Giorgia Del Fabbro. (2021). Sustainable fashion and the role of personality traits in determining the Purchase Likelihood and the Willingness To Pay for sustainable apparel.

Clifton Mark. (2024). How American Gen Z & Millennials approach fashion differently. https://business.yougov.com/content/50897-how-gen-z-millennials-approach-fashion-differently

Duong, C. D. (2022). Big Five personality traits and green consumption: bridging the attitude-intention-behavior gap. Asia Pacific Journal of Marketing and Logistics, 34(6), 1123–1144. https://doi.org/10.1108/APJML-04-2021-0276

Ellen Macarthur Foundation. (2017). A NEW TEXTILES ECONOMY: REDESIGNING FASHION'S FUTURE. https://www.ellenmacarthurfoundation.org/a-new-textiles-economy

Farid, D., Shakaib, A., Zulfikar, S., Bhutto, A., Farid, D. S., & Ali, M. (2018). Munich Personal RePEc Archive Effects of Personality on Impulsive Buying Behavior: Evidence from a Developing Country Effects of Personality on Impulsive Buying Behavior: Evidence from a Developing Country.

Fornell, C., research, D. L.-J. of marketing, & 1981, undefined. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journals.Sagepub.ComC Fornell, DF LarckerJournal of Marketing Research, 1981•journals.Sagepub.Com, 18(1), 39–50. https://doi.org/10.1177/002224378101800104

Ganesh Babu, S., & Gupta, S. (2023). Impact of Personality traits on Collaborave Fashion Consumpon: A Review.

Gullstrand Edbring, E., Lehner, M., & Mont, O. (2016). Exploring consumer attitudes to alternative models of consumption: Motivations and barriers. Journal of Cleaner Production, 123, 5–15. https://doi.org/10.1016/j.jclepro.2015.10.107

Hair, J. (2009). Multivariate Data Analysis. Faculty Articles. https://digitalcommons.kennesaw.edu/facpubs/2925

Han, H., Hsu, L. T. (Jane), & Sheu, C. (2010). Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmental friendly activities. Tourism Management, 31(3), 325–334. https://doi.org/10.1016/j.tourman.2009.03.013

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1–55. https://doi.org/10.1080/10705519909540118

Iran, S., Geiger, S. M., & Schrader, U. (2019). Collaborative fashion consumption – A cross-cultural study between Tehran and Berlin. Journal of Cleaner Production, 212, 313–323. https://doi.org/10.1016/j.jclepro.2018.11.163

Lee, S. H., & Huang, R. (2020). Exploring the motives for online fashion renting: Insights from social retailing to sustainability. Sustainability (Switzerland), 12(18). https://doi.org/10.3390/su12187610

McCoy, L., Wang, Y. T., & Chi, T. (2021). Why is collaborative apparel consumption gaining popularity? An empirical study of us gen z consumers. Sustainability (Switzerland), 13(15). https://doi.org/10.3390/su13158360

McCrae, R. R., & John, O. P. (1992). An Introduction to the Five-Factor Model and Its Applications. Journal of Personality, 60(2), 175–215. https://doi.org/10.1111/J.1467-6494.1992.TB00970.X

Mustofa, A., & Setiawan, A. (2022). Perceived Behavioral Control Builds Students' Entrepreneurial Intentions. AL-ISHLAH: Jurnal Pendidikan, 14(3), 3241–3248. https://doi.org/10.35445/ALISHLAH.V14I3.1511

Neerattiparambil, N. N., & Belli, S. M. (2020). Why rent a dress ?: A study on renting intention for fashion clothing products. Indian Journal of Marketing, 50(2), 20–34. https://doi.org/10.17010/ijom/2020/v50/i2/150439

Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. In Nature Reviews Earth and Environment (Vol. 1, Issue 4, pp. 189–200). Springer Nature. https://doi.org/10.1038/s43017-020-0039-9

Parguel, B., Lunardo, R., & Benoit-Moreau, F. (n.d.). Sustainability of the Sharing Economy in Question: When Second-Hand Peer-to-Peer Platforms Stimulate Indulgent Consumption.

Robert R. McCrae, & Paul T. Costa Jr. (2008). Empirical and Theoretical Status of the Five-Factor Model of Personality Traits. SAGE Publications.

Saran, R., Roy, S., & Sethuraman, R. (2016). Personality and fashion consumption: A conceptual framework in the Indian context. Journal of Fashion Marketing and Management, 20(2), 157–176. https://doi.org/10.1108/JFMM-04-2015-0032

Shetu, S. N., Tuhin, Md. K. W., & Hoque, M. A. (2025). Collaborative Fashion Consumption: A Systematic Literature Review. International Journal of Business and Technopreneurship (IJBT), 15(2), 135–154. https://doi.org/10.58915/ijbt.v15i2.1306

Weston, R., & Gore, P. A. (2006). A Brief Guide to Structural Equation Modeling. The Counseling Psychologist, 34(5), 719–751. https://doi.org/10.1177/0011000006286345

White, K., Habib, R., & Hardisty, D. J. (2019a). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. Journal of Marketing, 83(3), 22–49. https://doi.org/10.1177/0022242919825649

White, K., Habib, R., & Hardisty, D. J. (2019b). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. Journal of Marketing, 83(3), 22–49. https://doi.org/10.1177/0022242919825649

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Designing for Vertical Needs: Creating a Ladder Chair for Ergonomic and Space-Saving Solutions

ABSTRACT

As creative and academic studio spaces grow increasingly constrained, the demand for multi-functional furniture solutions becomes more critical. This study focused on the design, fabrication, and evaluation of a multifunctional ladder chair that addresses vertical access and space-saving needs in Ghanaian educational and workshop environments. Employing a studio-based, practice-led methodology, the study combined the use of sustainable materials, anthropometric data, and hybrid production techniques to produce a user-centred product. The ladder chair was fabricated with mild steel and maple hardwood, merging metalworking and traditional woodworking processes to ensure structural integrity and ergonomic comfort. The assessment after the fabrication evaluated visual appeal, transformation ease, and load stability. Instructors, students and artisans' observational feedback was thematically analyzed, shedding light on material quality, functional intuitiveness, user safety, space optimization, and educational relevance. Users lauded the ease of the transformation mechanism, compact form, and strong material contrast, signifying the product's success in achieving functional and spatial objectives. The research reveals that efficient multifunctional furniture contributes to improved space utilization and learner engagement in TVET environments. Beyond its practical design purpose, the ladder chair stands as a meaningful instructional model for project-based learning. Implications emphasize the importance of adaptive furniture in supporting sustainable development, skills training, and institutional design innovation. The research recommends future exploration into modular designs, lightweight materials and broader user testing to improve inclusivity and scalability.

Keywords - Ergonomic design, Hybrid materials, Multifunctional furniture, Space efficiency, Sustainable design.

1. Introduction

As global urbanisation continues to reshape work and living spaces, the availability and affordability of interior landscapes are now critical concerns in planning and design (Prakash et al., 2022). As compact living becomes increasingly prevalent, it has brought about smaller flats, collaborative offices, and versatile learning areas, demanding a fresh interpretation of the –space dynamic. Amid this spatial evolution, the need for multifunctional, adaptable, and vertically efficient furniture has increased. Modern consumers and designers seek solutions that deliver multifunctionality within compact spaces, merging form, usability and comfort (Taifa & Desai, 2017).

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Among potential design responses, the ladder chair, a fusion of chair and stepladder functions, offers a particularly effective solution. This multifunctional piece offers regular seating and addresses vertical accessibility, which makes it mostly pertinent in settings where space limitations make it impossible to incorporate several independent furniture pieces. It can be used in a variety of settings, including offices, homes, studios, libraries and workshops. The ladder chair is more than just a gimmick; it belongs to a wider design paradigm focused on furniture that responds to changing spatial roles, vertical relationships, and bodily motion.

The concept of multifunctional furniture is not a new one. Secretaries, step-chairs and library ladders were examples of convertible furniture pieces used in aristocratic interiors during the 18th and 19th centuries that were designed to combine luxury and functionality (Thariq et al., 2010). Unlike these early examples, which stressed ornamentation and class distinction, modern interpretations prioritize comfort, functional efficiency and sustainability (Dittakavi Tarun et al., 2017). In today's context, furniture must transcend multifunctionality to embody safety, efficiency, and ergonomic accuracy based on human anthropometry, the systematic analysis of body measurements and posture.

As a result, ergonomics is now an important element of contemporary furniture design. A poorly designed furniture can lead to postural discomfort, exhaustion, and even chronic health issues like joint strain and lower back pain (Pain et al., 1996). Ignoring anthropometric diversity, including differences in limb proportions, stature or balance capacity, in the design of a ladder chair can heighten potential hazards. To ensure suitability for various user groups, critical design aspects such as riser height, tread width, seat depth, and support angles need customization. An ergonomically designed ladder chair promotes both safety and ease of access, efficiently utilising space in schools where frequent access to high storage areas is required (Ofield, 2025).

The fabrication of such adaptive furniture is further reinforced by sustainable design principles. Issues related to material sourcing, lifecycle assessment, and product disposal are drawing greater attention to the global design industry. Consequently, the use of locally available, biodegradable, and renewable materials such as bamboo, engineered boards, and reclaimed wood is gaining increasing popularity (Yang & Zhang, 2023). These materials support the principles of the circular economy while reducing their environmental footprint. Integrating such materials carries significant socioeconomic implications in Ghana and other developing countries, fostering local value chains, and promoting indigenous. Practically, the study adds to sustainable design practice by providing a locally adaptable solution that enhances safety, spatial efficiency, and material utilisation in both institutional and domestic environments. This relevance to real-world furniture production and TVET application reinforces its value for policy, training, and industry adoption.

The design and construction of ladder chairs can be utilised as a project-based learning activity in TVET, giving students a chance to practise design thinking, woodworking techniques, and ergonomic analysis in a practical setting (Pongo et al., 2014; Usman & Tyabo, 2013; Famiwole et al., 2012). This approach aligns with global trends in TVET pedagogy that emphasize problem-solving, experiential learning, and industry relevance. In addition, it connects conceptual understanding with real-world outcomes, allowing students to design solutions that balance utility and aesthetics. Theoretically, the study extends discourse in ergonomic furniture design by linking anthropometric principles to multifunctional design theory, offering insights into how vertical access and human-centered design can be synthesised within small-space environments. Methodologically, the research integrates user needs assessment, anthropometric measurement, and design prototyping to generate empirically grounded design data; an approach that strengthens its academic robustness and reproducibility.

Despite these advantages, the ladder chair remains underexplored in academic literature. The ladder chair is frequently disregarded as a specialised design intervention in space-efficient furniture studies because they typically focus on foldable items, modular systems, or wall-mounted units (Sathishranganathan et al., 2019; Bai et al., 2024). Therefore, by investigating the design, development, and assessment of a ladder chair that is ergonomically responsive, sustainably made, and suitable for institutional settings, this study fills a crucial gap.

The study, which is based on anthropometric analysis, user needs assessment, and design prototyping, suggests a model that is useful in real-world applications and advances academic discussions in the domains of furniture innovation, interior architecture, and product design. The availability of interior space has become a crucial concern in Ghana, as global urbanisation transforms living and working environments. This reflects a broader philosophical shift in interior environments (Pongo et al., 2014). In order to solve vertical accessibility and space limitations in educational and workshop settings, there has been a sharp increase in demand for multipurpose, flexible furniture, like the ladder chair. The objective of this research is to create and assess a sustainable, ergonomic ladder chair that promotes TVET pedagogy and increases spatial efficiency. It is expected that the outcomes will strengthen TVET pedagogy, influence design innovation, and encourage continued exploration of versatile furniture solutions.

2. Literature Review

2.1 Historical Context and Evolution of Ladder Chairs

Throughout history, furniture has mirrored the evolution of society, culture, and technology. The ladder chair, an evolution of the traditional ladder-back chair characterised by horizontal slats resembling a ladder, emerged as a product of necessity and creativity. The ladder-back chair, which emerged in medieval Europe and became widespread in 17th-century England, exemplified durability, simplicity, and ease of manufacture (Niedderer & Reilly, 2010). Its design became a fixture in colonial American households, aligning with the modest aesthetic values of Protestant homes during the Reformation. Over time, decorative enhancements were introduced, marking a gradual shift toward the integration of function and aesthetics.Referred to as the Franklin chair after Benjamin Franklin, who is commonly credited with its creation, the step chair signified a notable evolution. This design transformed perceptions of multifunctional furniture by incorporating a folding mechanism that enabled the chair to convert into a compact set of steps (Ulrich et al., 2020). Its multifunctional nature offered a practical solution to the challenge of vertical access in confined spaces, and its adaptability continues to inspire contemporary reinterpretations of ladder chair designs.The ladder chair has garnered growing attention within modern design circles due to its ergonomic benefits, space-conscious design, and enduring historical importance. Zemp et al. (2015) state that furniture that adjusts to space limitations without compromising comfort or style is becoming more and more popular among academics and businesses. As a result, modular, convertible furniture systems, of which the ladder chair is a striking example, have attracted renewed attention.

2.2 Multi-Functionality and Adaptive Design in Furniture

Multifunctionality has become a key component of both residential and commercial furniture design as urban living areas get smaller and user needs change. Furniture designed to perform several functions within limited spaces is known as multifunctional furniture. This is often accomplished through innovative structural adjustments or concealed mechanisms (Pheasant & Haslegrave, 2006). Examples include ladder chairs, expandable tables, and foldable beds. These innovations respond to the increasing

demand for flexibility, portability, and space optimisation in offices, homes, libraries, and learning environments (O'Sullivan et al., 2012).

The ladder chair stands out as a remarkable example of adaptive design. It eliminates the necessity for multiple furniture items by allowing a seamless shift between sitting and climbing functions, thereby optimising space and minimising clutter (Göktaş et al., 2024; Al-Hinai et al., 2018). This approach aligns with the principles of functional minimalism, which advocates for clean, adaptable, and user-focused interior environments (Zemp et al., 2015).

Multifunctionality is likewise linked to enhanced user satisfaction and psychological well-being. Furniture that can be adjusted has a positive impact on users' perceptions of control over their surroundings, which enhances well-being and productivity (Musa, 2011). This adaptability also enhances workflow efficiency in institutional environments such as TVET workshops by minimizing the time spent on furniture reorganisation and optimizing space for multiple simultaneous activities.

2.3 Material Selection and the Role of Hybrid Composition

Any furniture piece's structural integrity, visual appeal, and environmental impact are all greatly influenced by the materials chosen and combined. Because of its availability, tactile comfort, and inherent warmth, wood has historically been the most common material used to construct ladder chairs. Strong and long-lasting woods like maple, oak, or teak are preferred, especially in situations where the chair must accommodate both sitting and climbing activities (Takyi Mensah, 2023). Using "maverick" woods that embrace natural imperfections, craftspeople like Matthew Burt have popularised a sustainability-conscious approach that emphasises both beauty and resourcefulness (Yang & Zhang, 2023).

Metal, particularly aluminium or stainless steel, is being used more and more in modern designs to improve both structural stability and aesthetic appeal. Particularly in tubular frames or thin-walled sections, metal provides excellent tensile strength, corrosion resistance, and design versatility (Boateng, 2012). The contrasting textures and aesthetic components create a remarkable blend of industrial and natural design when paired with wood.

Strong, lightweight, and aesthetically pleasing pieces can be made thanks to the hybrid composition of metal and wood. To guarantee strong joints and harmonious visual alignment, this method necessitates exact fabrication techniques. The fusion of these materials necessitates sophisticated joinery and welding skills, as well as close attention to material compatibility, surface finishes, and fastener selection to prevent structural weaknesses or mismatches in thermal expansion (Adu-Gyamfi et al., 2016).

The advantages of hybrid furniture designs for the environment are also highlighted by recent studies. The carbon footprint of production is greatly decreased by using recyclable metals and reclaimed wood (Viennet & Pont, 2017). Furthermore, these designs promote local value chains, particularly in developing nations where craftsmanship traditions and material availability can be efficiently leveraged for sustainable development.

2.4 Ergonomics and User Safety in Multi-Functional Furniture

The success of the ladder chair primarily rests on its capacity to support a variety of human users for a range of tasks. Ergonomics, the study of designing for human comfort and safety, becomes crucial in

this situation. When used in busy settings like studios, schools, and workshops, a badly designed ladder chair can be extremely dangerous (Fien, 2009).

Ladder chairs that are ergonomically sound must be customised to anthropometric measurements, taking into consideration factors like posture, balance, reach range, and stature. It is necessary to carefully calculate parameters like step spacing, seat width, backrest inclination, tread depth, and riser height. Furniture for workshops must specifically support dynamic postures, such as standing, climbing, reaching, and sitting, often in rapid succession (Takyi Mensah, 2023).

Non-slip treads, weight-bearing stability, and balanced center-of-gravity configurations that stop tipping are frequently features of safer designs. Prakash et al. (2022) state that ladder chairs and other dual-purpose furniture need to be subjected to stringent stability testing, especially at joints and conversion hinges, which are frequent failure points.

Additionally, rounding sharp edges, locking mechanisms, and clear markings can all improve user safety by lowering the chance of accidents. This is particularly important in high-traffic or educational settings where users might not be accustomed to weight limits or transformation mechanisms.

2.5 Fabrication Techniques: Integrating Craft with Innovation

The creation of a hybrid ladder chair requires expertise in both metalworking and woodworking, two disciplines with different customs, equipment, and material properties. Precision and a thorough comprehension of grain orientation, moisture content, and dimensional stability are essential for woodworking processes like cutting, planing, sanding, and joining (Taifa & Desai, 2017). Maple hardwood was used strategically in the researchers' ladder chair to balance weight, durability, and aesthetic appeal.

Cutting metal pipes, welding, grinding, and applying protective finishes are all part of the fabrication process on the metalworking side. To guarantee smooth, stable, and corrosion-resistant results, tools like welding machines, angle grinders, and powder-coating equipment are utilised (Bai et al., 2024).

Careful engineering is needed at the wood-metal junctions to prevent material fatigue, corrosion, and loosening. To address these issues, methods like hybrid welding brackets, epoxy adhesives, bolting, and sleeve insertion have been developed (Ofield, 2025). Pre-drilled metal frames and reinforced hinge mechanisms supported bolted joints in the researchers' project, enabling safe transitions between ladder and chair modes.

Furthermore, surface treatment is crucial to guaranteeing durability. While anti-rust primers and enamel paints protect metal components from environmental deterioration, finishing wood with sanding sealer and varnish improves tactile comfort and provides moisture protection (Göktaş et al., 2024; Al-Hinai et al., 2018).

2.6 Educational and Institutional Relevance of Ladder Chair Design

Ladder chair design has ramifications for education and skill development in addition to product innovation. These kinds of projects are useful venues for contextual problem-solving, cross-disciplinary cooperation, and project-based learning in TVET institutions. Takyi Mensah (2023) and Uwaifo (2009) highlight how students can synthesise principles of design thinking, engineering, and sustainability to produce practical furniture solutions for institutional use.

In addition, experiential projects like ladder chairs cultivate craftsmanship accuracy, problem-solving abilities, and artistic autonomy, which are vital for learners entering fields such as carpentry, sculpture making, architecture, and furniture design. Hands-on interaction with actual materials and practical limitations transforms learning into an experiential process that enhances comprehension and long-term skill mastery (Adu-Gyamfi et al., 2016; Niedderer & Reilly, 2010).

Within resource-limited settings, adaptive furniture supports institutions in achieving spatial optimisation, economic efficiency, and ergonomic, user-focused layouts. Consequently, the ladder chair transcends its role as a mere design object to become an educational resource, an economic innovation, and a symbol of interdisciplinary collaboration.

3. Materials and Methods

3.1 Research Approach

This research employed a practice-driven, studio-centered methodology suitable for exploration within design and fabrication contexts. Practice-led research puts creative practice at the forefront of knowledge production, enabling iterative exploration through making (Adu-Gyamfi et al., 2016). The objective was to design, build, and test a ladder chair that combines sustainable material selection, ergonomic principles, and effective spatial utilisation, especially in workshop and vocational settings. This methodological approach followed a cyclical process involving conceptual design, prototyping, evaluation, and refinement. Each phase was documented and analysed to establish a link between theory and practice. The design stage involved ideation and sketch development based on anthropometric data and user requirements. The prototyping stage translated these ideas into tangible outcomes through material selection, joinery planning, and construction. The testing phase engaged users to assess ergonomics, stability, and functional efficiency, with feedback informing iterative improvements. This triangulation of design, fabrication, and evaluation ensures methodological transparency, reproducibility, and academic robustness consistent with design-based research traditions.

3.2 Materials Used

Hardwood and mild steel were carefully chosen for the ladder chair's construction based on their availability, workability, and mechanical qualities. Structural performance, aesthetic appeal, and conformity to sustainable design principles were taken into consideration when selecting materials. Table 1 below shows all the materials used for the fabrication of the ladder chair.

Table 1. Materials used for ladder chair fabrication

Material	Purpose/Use
Maple Hardwood	Seat, steps, and backrest
Mild Steel (25 mm square pipe)	Frame structure and support
Hinges (metal)	For the transformation mechanism
Bolts and Nuts	For wood-metal joining
Sanding Sealer	Wood surface finishing and sealing.
Varnish	Protection and enhancement of wood texture
Anti-Rust Primer	Prevent corrosion on metal surfaces.
Oil-Based Paint	Final finish on metal components

Because of its fine grain, ease of machining, and durability, maple hardwood was chosen. Because of its high tensile strength and suitability for powder coating and welding, mild steel was selected. To guarantee affordability and encourage regional craftsmanship, these materials were procured locally.

3.3 Design Process

Detailed working drawings, orthographic projection draughting, and hand sketching were all part of the design process. To guarantee ergonomic compliance, emphasis was put on using precise anthropometric measurements. To accommodate a variety of users, the seat height, tread dimensions, backrest angle, and step spacing were modified using information from Taifa & Desai (2017). To begin with the fabrication process, Figure 1 below shows the Conceptual Design Sketch and Orthographic Drawing aimed at guiding the researchers to create a great functional art piece.

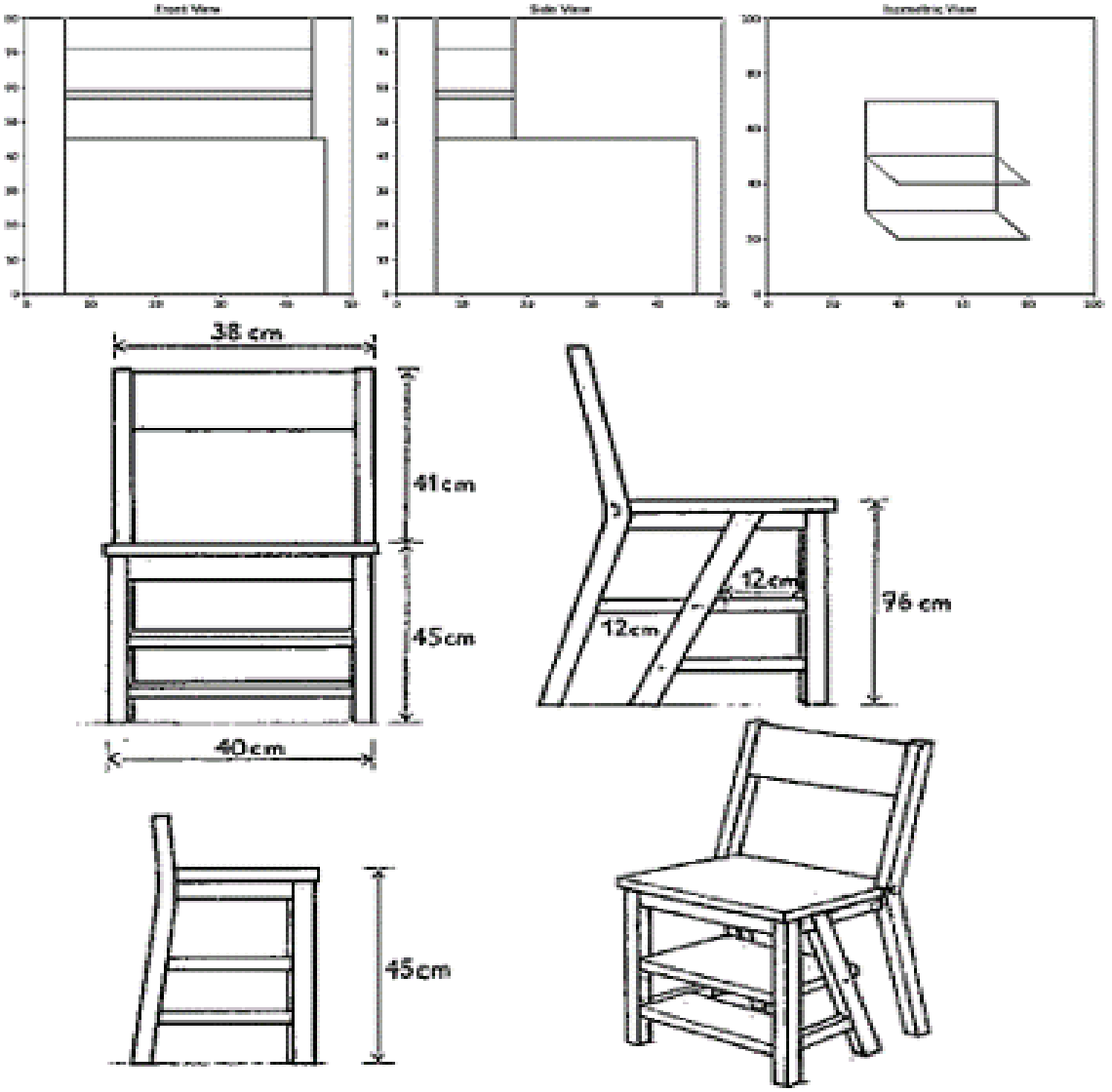

Fig 1. Conceptual Design Sketch and Orthographic Drawing (Authors' construct, 2025)

3.4 Fabrication Procedure

The fabrication process was broken down into four main stages: design conceptualisation, which included creating orthographic drawings and sketching them; material selection, which involved sourcing and evaluating wood, metal, and fasteners; fabrication and finishing, which included machining steel and wood, welding, drilling, sanding, coating, and joining components; and evaluation and refinement, which included structural verification, functional testing, and user observation. The fabrication process is displayed in Table 2 below.

Table 2. Fabrication Phases and Activities

Phase	Description
Design Conceptualization	Sketching and generating orthographic drawings
Material Selection	Sourcing wood, metal, and fasteners; assessing material quality
Fabrication and Finishing	Machining wood and steel, welding, drilling, sanding, coating, and joining
Evaluation and Refinement	Functional testing, user observation, and structural verification

3.4.1 Woodworking Operations

Among the woodworking tasks were:
1. Using a table and mitre saws to cut maple boards
2. Using belt and orbital sanders for shaping and smoothing
3. Drilling bolt junction holes precisely
4. Applying sanding sealer and varnish for sealing and finishing

3.4.2 Metalworking Operations

Involved in the fabrication of metal:
1. Using abrasive saws to cut mild steel square pipes
2. Using MIG welding to assemble the frame
3. Smoothing weld joints by grinding and polishing
4. Using anti-rust primer for priming and oil-based paint for finishing

Following the fabrication phases and activities as outlined in Table 2 above, Figure 2 below shows all the operational activities on the woodworking and metalworking phases, like machining, welding, drilling, sanding, coating, and joining, and ends with the evaluation and refinement.

Fig 2. Workshop activities (Measuring → Cutting → Welding → Grinding → Assembling→ Finishing→ Testing (Source: Saah, 2025)

3.4.3 Assembly and Integration

After the metal and wood parts were finished, they were assembled using:
1. Bolted joints that were pre-drilled to join the metal to the wood
2. The hinges that allow you to switch between chair and ladder positions
3. Gussets and brackets to strengthen load-bearing joints

3.5 Safety and Quality Testing

After it was finished, the ladder chair was put through a battery of performance, usability, and safety tests. Given the product's dual functionality and potential for use in studio and educational settings, this was crucial. As shown in Table 3, the ladder chair underwent safety and usability evaluation, which included tests for load capacity, stability, ergonomic comfort, and transformation ease; all criteria were successfully met, with the chair supporting 120 kg, resisting tipping, offering comfortable posture, and converting within 10 seconds.

Table 3. Safety and Usability Evaluation Criteria

Criterion	Test Method	Outcome
Load Capacity	Static weight application (120 kg)	Passed
Stability	Tipping resistance simulation	Passed
Ergonomic Comfort	Postural analysis in the seated position	Passed
Transformation Ease	Conversion time and steps counted	Passed (10 seconds)

These tests validated the ladder chair's dependability, security, and performance in both normal and extreme circumstances.

4. Post-Studio Stage, Findings, and Aesthetic Appreciation

4.1 Post-Studio Reflections

The ladder chair project's post-studio phase signalled a significant shift from fabrication to functional and aesthetic assessment. During this phase, the entire production process, from sourcing materials and technical execution to design alignment and end-user experience, was reflectively assessed. The researchers aimed to ascertain whether the final product achieved its intended design goals to provide

a piece of furniture that is safe, ergonomic, and space-efficient and can be used as both a seat and a stepladder through careful observation and iterative feedback.

During this phase, reflections verified that the design was successful in turning the idea of a multipurpose chair into a real, functional item. The combination of contemporary metalworking techniques and traditional carpentry showed that, with careful execution and material selection, interdisciplinary fabrication techniques could produce cohesive outcomes. Additionally, the ladder chair presented a promising model for educational projects in Technical and Vocational Education and Training (TVET) institutions and had a high potential for replication in workshop-based settings.

Important information about usability, tactile experience, and structural performance was also discovered during this phase. For example, information on ergonomic flow and motion continuity was obtained from the way users engaged with the transformation mechanism. Understanding how intended users, such as students, teachers, and artisans, engaged with the product both functionally and spatially was made possible thanks in large part to the input obtained through structured observation.

4.2 Findings

4.2.1 Structural Integrity and Stability

The ladder chair's excellent structural performance under a range of use circumstances was one of the study's main conclusions. For adult users, the hardwood climbing and seating surfaces and mild steel frame provided adequate load-bearing capacity. With no indications of structural deflection or instability, static load testing verified that the chair could sustain weights of up to 120 kg in both chair and ladder configurations. The square steel pipe framing reduced the chance of tipping by providing a low centre of gravity and distributing the weight evenly across the base. The structural joints, particularly the bolted metal–wood interfaces, held up well under repeated transitions, indicating that the hinge mechanisms and fasteners selected were suitable for building hybrid furniture. These results support the claim made by Prakash et al. (2022) that, with careful reinforcement and alignment of connection points, mixed-material furniture can provide superior mechanical performance.

4.2.2 Functionality and Transformability

The ladder chair’s ability to switch between its two modes with ease and efficiency was another noteworthy result. The conversion mechanism only needed one pivot motion, which was held up by metallic hinges that were firmly attached to the steel frame and the wooden treads. Depending on user experience, the transformation time averaged 10–12 seconds. Other than lifting and repositioning the hinged backrest, no extra tools or physical effort were needed.

This transformation's ease of use and intuitiveness highlight the importance of user-centred design principles in multipurpose furniture. Yang et al. (2023) point out that space-saving furniture’s usability is improved by its intuitive convertibility, particularly in institutional settings where users may need to quickly modify their workspaces.

4.2.3 Ergonomic Alignment

The backrest angle, tread depth, step risers, and seat height were all designed with anthropometric analysis in mind. These dimensions fell within adult users’ comfortable ranges, according to post-studio observations. With a height of about 450 mm, the seat was in good alignment with accepted ergonomic seating guidelines. Safe climbing and standing during task performance were

made possible by the ladder's treads and risers, which were evenly spaced to support natural foot placement.

The ergonomic design is adequate, as users reported no undue strain when using the ladder or sitting for extended periods of time. These results corroborate those of Prakash et al. (2022), who stressed that in order to prevent discomfort or injury, multipurpose furniture needs to take into consideration a broad range of body dimensions and postural requirements.

4.2.4 Space Efficiency and Environmental Suitability

The ladder chair produced significant space-saving results. It freed up valuable floor space by integrating the functions of a chair and a ladder into a single footprint, eliminating the need for two distinct pieces of furniture. This benefit is especially pertinent in small design studios, workshops, and classrooms where workflow is improved by spatial flexibility.

Additionally, the ladder chair's small size in chair mode made it simple to integrate with workbenches or storage units. The product was perfect for spaces that use vertical storage because it was tall enough to reach overhead shelves in its ladder configuration. These results back up what Göktaş et al. (2024) and Al-Hinai et al. (2018) say that spatial adaptability is a basic necessity in contemporary learning and creative settings, particularly when resource limitations necessitate effectiveness and mobility.

4.3 Aesthetic Appreciation

From a design standpoint, the ladder chair offers a striking illustration of how practicality and aesthetic appeal can coexist peacefully. A contemporary yet cosy aesthetic appropriate for both residential and educational settings was provided by the contrast between natural maple wood and matte black mild steel. In addition to being useful, the materials chosen greatly enhanced the product's tactile and aesthetic appeal.

4.3.1 Material Aesthetics and Craftsmanship

The natural grain of the maple was highlighted by the application of sanding sealer and varnish to the wooden components, creating a smooth and welcoming surface finish. These finishes improved the product's tactile and visual appeal, making it wear-resistant and pleasant to the touch. On the other hand, the oil-based black paint and anti-rust primer-coated mild steel frame offered a visually solid foundation that represented robustness and longevity.

The high degree of craftsmanship involved was demonstrated by the precise hole placements, smooth corner curvature, and joint alignment. Sanding was used to soften all edges, especially the treads and the backrest, to guarantee comfort and safety when in contact. The focus on surface treatment supports Ofield's (2025) claim that fine craftsmanship in furniture design enhances aesthetic quality in addition to ensuring durability.

4.3.2 Design Language and Visual Balance

The product conveys intention and balance visually. With equal visual weight on both its vertical and horizontal axes, the ladder chair has a symmetrical silhouette. The simple joinery and subtle detailing reinforce the sense of visual stability created by this proportionality. The backrest's vertical slats reinforce the object's dual nature by subtly echoing the ladder function.

A minimalistic design language is supported by the restrained use of colour and material variation. Because of its restraint, the ladder chair can be used in a wide range of spatial settings without being overly noticeable or stylised.

4.3.3 Perception and User Response

Based on unofficial observational feedback, the first user reactions were overwhelmingly positive. The product's aesthetic clarity, transformation mechanism, and compactness were all praised by users. Curiosity was piqued by the dual-use design's functional novelty, and instant interaction was encouraged by its simplicity of use.
These answers support Yang et al.'s (2023) findings that users value furniture designs that provide surprise, adaptability, and meaningful engagement. In this sense, the ladder chair adds to a more dynamic and interesting built environment in addition to fulfilling a functional need.

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4.4 Thematic Analysis of Observational Feedback

To combine insights from both formal and informal observations made during the post-studio evaluation of the ladder chair prototype, a qualitative thematic analysis was carried out. Students, teachers, and workshop employees were among the users who were encouraged to use the product in both chair and ladder modes. Emergent themes on perceived value, comfort, safety, functionality, and aesthetics were used to classify the feedback.

Theme 1: Functional Intuitiveness and Ease of Transformation
The transformation mechanism was praised by many users as "simple," "intuitive," and "surprisingly smooth." Without verbal guidance, participants were able to transform the chair into a ladder, according to observers, typically in 10–12 seconds. The product's "useful dual-purpose" and "clever design" were also praised by users.

"I like that you don't need to press or unlock anything; it just folds and works."
(Participant 3, Instructor)

This indicates a high level of functional transparency, in which the product makes clear its intended uses and does not require any prior technical knowledge. One of the study's main design tenets, user-friendly transformation devoid of complicated mechanisms or tools, is validated by this (Prakash et al., 2022).

Theme 2: Perceived Ergonomic Comfort and Safety
Strong user satisfaction with regard to perceived safety and physical comfort was also noted in the feedback. While the ladder mode was characterised as "secure" and "trustworthy," even when climbing with tools in hand, the chair mode provided a stable and balanced seating experience.

"The seat is firm but comfortable. I could sit and work for a while without feeling stiff."
(Participant 6, Student)

"It doesn't shake when you climb it. The steps feel solid and well-spaced."
(Participant 1, Technician)

This theme confirms previous findings that well-proportioned dimensions and anthropometric compliance enhance comfort and physical confidence during use (Sathishranganathan et al., 2019). Furthermore, perceptions of structural stability were improved by visual cues like metal framing and thick treads.

Theme 3: Aesthetic Appeal and Material Quality
The contrast between the matte black metal frame and the natural wood was frequently praised by participants. The chair was characterised by observers as “clean,” “modern,” and “minimalistic”. The wood’s finish was praised for being smooth and showing the grain, which conveyed a feeling of fine craftsmanship.

“This would look great in a design studio or even a minimalist home. The wood is beautiful.”
(Participant 4, Artisan-in-training)

An often-underappreciated result of functional furniture design is user trust and emotional connection, which were bolstered by the handcrafted quality and obvious attention to surface detailing (Pain et al., 1996).

Theme 4: Space Efficiency and Contextual Relevance
The product's alignment with space-saving goals was also validated by feedback. The chair’s small footprint and ability to "disappear" into the layout when not in ladder mode were particularly valued by users in institutional and workshop settings.

“This replaces two items with one. And I can slide it near the bench when I don’t need it.”
(Participant 5, Workshop Assistant)

This theme highlights that space efficiency encompasses more than just physical dimensions; it also involves how well furniture fits into a changing environment. Practical benefits of the chair included its small size, ability to stack, and unobtrusive appearance.

Theme 5: Educational Value and Design Inspiration
Lastly, the ladder chair’s potential as a design learning tool was discussed by a number of participants, particularly instructors and advanced students. They indicated interest in teaching workshop skills, material integration, and human-centered design through comparable fabrication projects.

“This would be a great project for Level 200 sculpture, interior design, and furniture students. It covers metal, wood, joinery, and ergonomics in one.”
(Participant 2, Instructor)

As a result, the product's value goes beyond its usability to include a pedagogical platform, technical training, and a catalyst for creativity in vocational design education (Ofield, 2025; Takyi Mensah, 2023; Viennet et al., 2017).

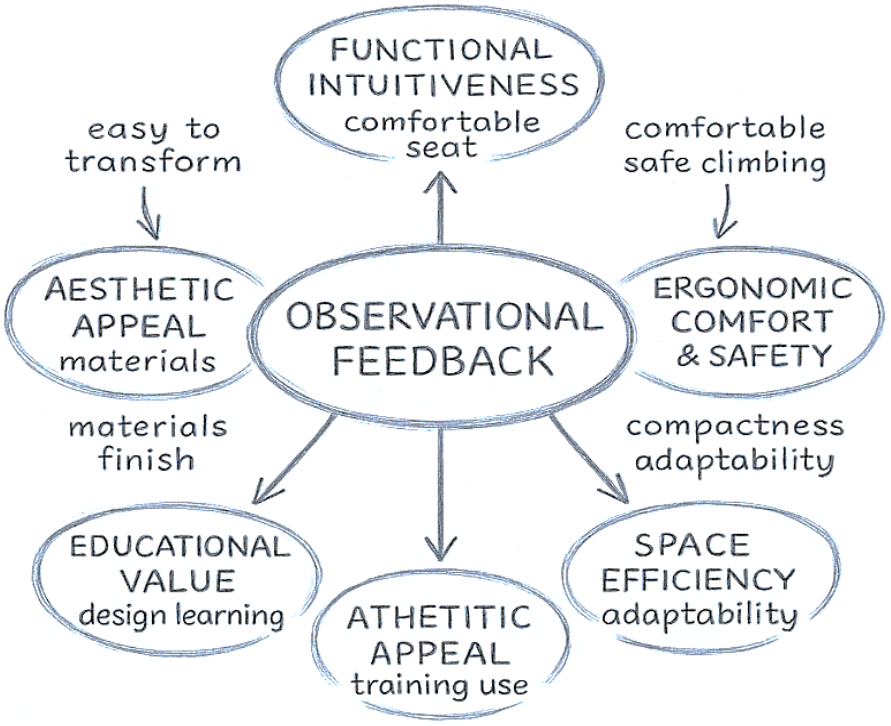

Fig 3. Graphical thematic map (Authors' construct, 2025)

Figure 3 above illustrates how the thematic analysis not only supports the ladder chair design's user-centred goals but also offers insightful information about its wider applicability as a tool for ergonomic, educational, and spatial innovation.

5. Summary, Conclusions, Recommendations, and Implications of the Findings

5.1 Summary of the Study

This study concentrated on designing, creating, and testing a multipurpose ladder chair that can be used for vertical access and seating in small spaces. Guided by a practice-led, studio-centered approach, the research combined eco-friendly materials, mixed fabrication techniques, and anthropometric data to produce a prototype adaptable to design studios, educational settings, and other compact institutional spaces. Employing traditional woodworking alongside metalworking techniques, the chair was fabricated from maple hardwood and mild steel square tubing. Its dimensions and folding mechanism were guided by human-centered design principles, with orthographic projections informing the physical construction.

After fabrication, the chair was evaluated for structural robustness, ergonomic performance, transformation efficiency, and visual appeal, with user feedback analysed thematically. The findings confirmed the chair's robust construction, appealing aesthetics, and user-friendly functionality. The outcomes showed how such a design could improve design education by providing real-world, multidisciplinary learning experiences in addition to solving practical space problems.

5.2 Conclusions

Regarding the applicability and possibilities of dual-purpose furniture design, the ladder chair project provided a number of insightful findings. Firstly, the study demonstrated that combining climbing and seating functions within one piece effectively minimises furniture duplication, enhancing space efficiency. The chair accommodated both sitting tasks and safe access to elevated storage, proving highly beneficial in compact environments.

Secondly, insights from user interaction and observational data confirmed adherence to ergonomic principles. Participants reported no discomfort while using the seat, steps, or backrest, all of which were found to be dimensionally safe and comfortable. This underscores the importance of grounding design decisions in anthropometric data to ensure user well-being.

Thirdly, the hybrid use of metal and wood ensured a balance between sustainable material use, structural performance, and aesthetic refinement. The visual harmony created by the matte-black metal and varnished maple reflected deliberate care in material selection and finishing.

Fourth, there were no tools or instructions needed for the smooth and simple transition between chair and ladder modes. The product's usefulness and appropriateness for dynamic learning environments were enhanced by its ease of conversion.

Lastly, the study verified that these design projects have significant educational value in addition to being pertinent for resolving actual spatial problems. The ladder chair integrated design thinking, craftsmanship, and problem-solving into a single, purposeful project, making it an example of project-based learning in Technical and Vocational Education and Training (TVET).

5.3 Recommendations

A number of suggestions are made in light of the study's findings to direct future research, practice, and innovation. First, in order to accommodate a variety of user groups, such as younger students, senior citizens, and people with physical limitations, it is advised that future prototypes include a greater range of anthropometric data. This would increase the product's applicability and inclusivity.

Second, future iterations could experiment with lighter and more affordable materials, even though the use of mild steel and maple provided durability and aesthetic appeal. Aluminium or laminated bamboo are two substitutes that could lighten the load and make transportation easier, particularly in situations where mobility is crucial.

Third, in subsequent iterations, designers ought to take modularity into account. It would be simpler to disassemble, maintain, and customize if knock-down joints or modular connections were used. Additionally, this would promote circular design principles, increasing the product's sustainability over time.

Fourth, it is advised that design instructors incorporate projects like ladder chairs into the curricula of polytechnic and TVET programs. Students can work together across disciplines, tackle real-world problems, and gain useful fabrication and design skills through these projects.

Lastly, the ladder chair should be investigated for commercialisation due to its strong functional and aesthetic appeal. The design could be modified by furniture manufacturers and interior designers for institutional settings, urban residences, and small offices where there is a strong need for space-saving solutions.

5.4 Implications of the Findings

The study's findings have a number of ramifications for sustainable furniture development, design education, and spatial planning. The ladder chair project emphasises the importance of practical,

multidisciplinary assignments that bridge theory and practice for educational institutions. Students working on these projects gain knowledge of design tools and fabrication methods as well as critical thinking, creativity, and teamwork abilities.

The study shows how multipurpose furniture can meet practical needs without sacrificing comfort, security, or aesthetic appeal from the perspective of design practice. The effective fusion of human-centered dimensions, mechanisms, and materials emphasises how crucial holistic thinking is to modern furniture design. From a sustainability standpoint, using hardwood that is sourced locally and making efficient use of materials are in line with international objectives for conscientious production and consumption. By reducing material waste and increasing functional output, the ladder chair helps achieve Sustainable Development Goal 12 (Responsible Consumption and Production).

Lastly, the study recommends that institutional planners spend money on flexible and effective adaptive furniture systems, especially in the educational and vocational sectors. The ladder chair serves as an example of how furniture can improve working, learning, and teaching environments in addition to helping with spatial problem-solving.

Acknowledgement

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References

Adu-Gyamfi, S., Donkoh, W. J. & Addo, A. A. (2016). Educational reforms in Ghana: Past and present. Journal of Education and Human Development, 5(3), 158–172. https://doi.org/10.15640/jehd.v5n3a17

Al-Hinai, N., Al-Kindi, M. & Shamsuzzoha, A. (2018). An Ergonomic Student Chair Design and Engineering for Classroom Environment. International Journal of Mechanical Engineering and Robotics Research, 7 (5), 534-543. https://doi.org/10.18178/ijmerr.7.5.534-543

Bai, Y., Kamarudin, K. M., & Alli, H. (2024). A systematic review of research on sitting and working furniture ergonomic from 2012 to 2022: Analysis of assessment approaches. Heliyon, 10(7), e28384. https://doi.org/10.1016/j.heliyon.2024.e28384

Boateng, C. (2012). Restructuring vocational and technical education in Ghana: The role of leadership development. International Journal of Humanities and Social Science, 2(4), 108-114.

Dittakavi Tarun, V., Mohan Srikanth, R., Jithendra Kumar, I., Mehar Anudeep, S., & Srikanth. (2017). Stress analysis on a chair-less chair. International Journal of Theoretical and Applied Mechanics, 12(4), 699-708.

Famiwole, R. O., Oke, J. O., & Amadii, N. S. (2012). Potentials of vocational and technical education: Empowering youths and vulnerable adults for poverty reduction in Nigeria. Journal of Science and Management, 1(2), 157-162.

Fien, J., Maclean, R. & Park, M. (Eds) (2009). Work, learning and sustainable development: Opportunities and challenges. Springer Dordrecht.

Göktaş, O., Ergin, E., Çetin, G., Hicret Özkoç, H., Fırat, A., & Gülsunar Gazel, G. (2024). Investigation of user-product interaction by determining the focal points of visual interest in different types of kitchen furniture: An eye-tracking study. Displays, 83, 102745. https://doi.org/10.1016/j.displa.2024.102745

Musa, A. I. (2011). Anthropometric evaluations and assessment of school furniture design in Nigeria:A case study of secondary schools in rural areas of Odeda, Nigeria. International Journal of Industrial Engineering Computations, 2(3), 499–508. https://doi.org/10.5267/j.ijiec.2011.03.006

Niedderer, K., & Reilly, L. (2010). Research practice in art and design: Experiential knowledge and

organised inquiry [Editorial]. Journal of Research Practice, 6(2), 1-11. Article E2. http://jrp.icaap.org/index.php/jrp/article/view/247

O'Sullivan, K., O'Keeffe, M., O'Sullivan, L., O'Sullivan, P., & Dankaerts, W. (2012). The effect of dynamic sitting on the prevention and management of low back pain and low back discomfort: a systematic review. Ergonomics, 55(8), 898–908. https://doi.org/10.1080/00140139.2012.676674

Ofield, J. (2025, April 27). Can Your Office Chair Impact Your Health? Houston Experts Say Yes! Rosi Inc. https://www.rosiinc.com/blog/your-office-chair-impacts-your-health/ Pain, H., Pascoe, J., Gore, S., & McLellan, D. L. (1996). Multi-adjustable chairs for children withdisabilities. Journal of medical engineering & technology, 20(4-5), 151–156. https://doi.org/10.3109/03091909609008395

Pheasant, S., & Haslegrave, C.M. (2006). Bodyspace: Anthropometry, Ergonomics and the Design of Work, Third Edition (3rd ed.). CRC Press. https://doi.org/10.1201/9781315375212

Pongo, N. A., Effah, B., Osei-Wusu, B., Obinnim, B., & Sam, F. K. (2014). The impact of TVET on Ghana's socio-economic development: A case study of ICCES TVET skills training in two regions of Ghana. American International Journal of Contemporary Research, 4(1), 185-192.

Prakash, S., Babu, S., & Shukla, S. (2022). Design and fabrication of chair cum ladder. International Research Journal of Modernization in Engineering Technology and Science, 4(3), 732-734.

Saah, M. (2025). Fabrication of ladder chair for sculpture workshop (Bachelor's thesis). Faculty of Applied Arts & Technology, Department of Sculpture Technology, Takoradi Technical University.

Sathishranganathan, C., Santhosh Kumar, G., Prakash, P. S., & Prabhakaram, J. G. (2019). Design and fabrication of chair-less chairs. International Journal of Innovative Technology and Exploring Engineering, 9(2), 103-107. https://doi.org/10.35940/ijitee.A4968.129219

Taifa, I. W., & Desai, D. A. (2017). Anthropometric measurements for ergonomic design of students' furniture in India. Engineering Science and Technology, 20(1), 232–239. https://doi.org/10.1016/j.jestch.2016.08.004

Takyi Mensah, E. (2023). Changes in Ghana's Technical and Vocational Education and Training since its Independence: From the Perspective of Educational Policy, International Journal of Vocational and Technical Education Research, 9 (2), 40-49. https://doi.org/10.37745/ijvter.15/vol9n24049

Thariq, M. M., Munasinghe, H., & Abeysekara, J. (2010). Designing chairs with mounted desktop for university students: Ergonomics and comfort. International Journal of Industrial Ergonomics, 40(1), 8–18. https://doi.org/10.1016/j.ergon.2009.10.003

Ulrich, K., Eppinger, S. & Yang, M. C. (2020). Product design and development (Seventh Edition). Irwin McGraw-Hill.

Usman, A. N., & Tyabo, A. (2013). Revitalizing technical and vocational education (TVET) for youth empowerment and sustainable development. Journal of Educational and Social Research, 3(4), 149–154. http://dx.doi.org/10.5901/jesr.2013.v3n4p149

Uwaifo, V. O. (2009). Training technology and vocational education teachers for the new 9-3-4 education system in Nigeria: Its problems and prospects. International NGO Journal, 4(4), 160–166.

Viennet, R. & B. Pont (2017). Education policy implementation: A literature review and proposed framework. OECD Education Working Papers, No. 162, OECD Publishing, Paris, https://doi.org/10.1787/fc467a64-en.

Yang, X., & Zhang, Z. (2023). Development of a Rehabilitation Chair Design Based on a Functional Technology Matrix and Multilevel Evaluation Methods. Applied Sciences, 13(20), 11404. https://doi.org/10.3390/app132011404

Zemp, R., Taylor, W. R., & Lorenzetti, S. (2015). Are pressure measurements effective in the assessment of office chair comfort/discomfort? A review. Applied Ergonomics, 48, 273–282. https://doi.org/10.1016/j.apergo.2014.12.010

Figure References : Figure 1, 2, 3: Authors' archives (2025)

From Craftsmanship to Convenience: A shift from Handmade to Modular Furniture in the Residential sector

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ABSTRACT

The Indian residential furniture sector is undergoing a transformative shift from traditional handmade furniture to modular systems, driven by rapid urbanization, evolving consumer preferences, and technological advancements in design and production. This study investigates the extent and impact of this transition in Pune, a Tier-2 city that has both traditional and contemporary lifestyles. Utilizing a mixed-methods approach, data triangulation method was used from surveys (157 respondents), interviews with stakeholders—including artisans, architects, interior designers, and furniture manufacturers—and a market review in literature. Findings reveal younger, urban consumers favor modular furniture for its affordability, quick assembly, and space efficiency, while older and high-income users continue to value the craftsmanship and durability of handmade products. Despite modular furniture's dominance in kitchens and wardrobes, challenges persist around durability and limited personalization. Whereas, handmade furniture faces barriers of cost, production time, and limited accessibility to artisan workforce. Thematic analysis strongly stresses on the emotional value and cultural significance of handmade furniture, in comparison with the utilitarian appeal of modular furniture. The most important excerpt is that, both consumer and industry respondents incline and propose a need for a hybrid model that integrates the artistic value of traditional methods with the efficiency and scalability of modular design. This study contributes to design by highlighting the potential of such hybrid systems to integrate sustainability, customization, and urban living needs in India's rapidly modernizing interiors market.

Keywords - Modular Furniture, Handmade Furniture, Consumer Preferences, Urbanization, Hybrid Design Systems, Pune Furniture Market.

1. Introduction

The furniture industry, both globally and in India, is experiencing a fundamental transformation shaped by urbanization, evolving consumer lifestyles, and increasing technological integration in design and production processes (Sharma & Gupta, 2022; Allied Market Research, 2022). A key trend within this transformation is the shift from traditional, handcrafted furniture—created by skilled artisans using natural materials and culturally embedded techniques—to modular furniture systems that offer efficiency, scalability, and a degree of mass customization (Amin & Kumar, 2022).

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This shift is primarily influenced by the evolving needs of contemporary city life. Modular furniture, usually made up of prefab, flat-pack parts, is particularly attractive to younger groups like nuclear families and professionals who value cost-effectiveness, ease of transport, and quick assembly, especially in small urban spaces (Li, 2022; Rao & Sen, 2023). The impact of worldwide design trends and the growth of online shopping have sped up this transition, with companies like IKEA making modular furniture more accessible in Indian cities (Market Research Future, 2023; Global Market Research, 2023). Conversely, handmade furniture is still cherished for its longevity, customization options, and craftsmanship—attributes that particularly appeal to older consumers and those with greater disposable income (Patel, 2022; Kumar & Reddy, 2021). Nevertheless, it confronts considerable hurdles in the current market, such as extended production timelines, elevated costs, and a decreasing number of skilled artisans (Traffic India & GFTN India, n.d.; Kumari, 2019). As consumer needs change, the conflict between the lasting nature and heritage of handmade items and the adaptability and cost-effectiveness of modular options becomes increasingly evident. Pune, a swiftly urbanizing Tier-2 city, offers an intriguing setting for this research because of its varied population of professionals, students, entrepreneurs, and traditional artisans. This blend of demographics makes it an excellent small-scale representation to analyze shifting furniture consumption behaviors and the changing relationships between traditional and contemporary design approaches (Aggarwal et al., n.d.; Dahiya, n.d.).

The primary objectives of this research are:

- To assess the impact of the transition from handmade to modular furniture on key industry stakeholders, including consumers, manufacturers, and interior designers.
- To evaluate whether modular systems are likely to dominate the future of residential furnishing or if a hybrid model—integrating artisanal techniques with modular frameworks—offers a more sustainable and culturally relevant solution.

Adopting a mixed-methods approach, this study triangulates insights from structured surveys, stakeholder interviews, and a comprehensive literature review to build a nuanced understanding of the shift in consumer preferences and production practices. Through this analysis, we aim to highlight the challenges and opportunities arising from this transformation and offer design and policy recommendations relevant to India's rapidly modernizing furniture sector.

Limitations: This research was conducted in the Pune region only. A future study can include more cities and regions and a larger sample to study.

2. Literature Review

2.1 Urbanization and the Furniture Industry, Global and Indian Market: Trends, Transformations, and Market Dynamics

The literature review emphasizes that Urbanization in India has been on a steady rise, with the urban population increasing from 34.03% in 2018 to 35.87% in 2022. The shift in demographics has notably affected consumer preferences, especially within the furniture sector. An increasing number of young professionals and smaller families are on the lookout for modern, space-saving, and aesthetically pleasing furniture options (Dahiya). The rising demand for multifunctional furniture, which addresses the limitations of urban living spaces while also being visually appealing, has played a role in boosting the modular furniture market. This sector of modular furniture is characterized by its dynamic nature and focus on flexibility, adaptability, and customization to meet a variety of consumer demands. The

market can be categorized into two primary segments: residential and commercial. The residential sector has experienced a rise in demand for space-saving items such as sofa beds, extendable dining tables, and modular shelving, which aligns with the growth of compact urban living spaces (Global Market Research). Furthermore, the global smart furniture market has seen impressive expansion, fueled by consumer preference for innovative home solutions that boost efficiency. According to a report from Allied Market Research, the market was valued at $2.6 billion in 2022 and is expected to grow to $4.2 billion by 2027, reflecting a compound annual growth rate (CAGR) of 10.3% from 2023 to 2027. This growth can be attributed to the increasing adoption of technologically advanced furniture designed to elevate functionality and convenience (Global Market Research). Likewise, the Indian furniture market has shown a strong growth trend, with an estimated worth of USD 23.12 billion. Projections suggest a forecasted CAGR of around 10.5% to 11% from 2024 to 2032. This growth is attributed to rising consumer demand across multiple segments, including high-end luxury residential properties, commercial spaces, retail establishments, and healthcare facilities. As urbanization continues to reshape consumer lifestyles, the demand for modular and smart furniture solutions is expected to grow, further driving market expansion. (Dahiya). The global and Indian residential furniture markets are experiencing significant transformation, with modular furniture gaining widespread traction due to urbanization, shrinking living spaces, and the rise of e-commerce, while handmade/custom furniture is expanding rapidly on the strength of personalization, sustainability, and rising disposable incomes. Globally, the modular furniture market is expected to grow at a CAGR of 4.7% to reach USD 130.6 billion by 2034, whereas the custom furniture market, growing at a faster CAGR of 9.2%, is projected to hit USD 65.67 billion by 2032. In India, modular furniture is forecasted to reach USD 7.53 billion by 2033 (CAGR 7.54%), driven by real estate growth, demand for space-saving solutions, and online retail expansion, while the broader Indian furniture market, including handmade/custom segments, is set to reach USD 72.11 billion by 2033 (CAGR 11.42%), propelled by strong artisanal traditions and government support for MSMEs. The future of the industry likely lies in hybrid solutions that combine modular efficiency with artisanal uniqueness, addressing evolving consumer expectations for affordability, customization, and environmental responsibility. The above review shows the rise in modular furniture but we don’t know if it is because of the market or changing preferences that has led to this change. This study shall help to answer it.

3. Methodology

This research utilizes a mixed-methods strategy, combining both qualitative and quantitative methods within a framework of data triangulation to explore the shift from traditional handcrafted furniture to modular furniture. Using various data collections improves the reliability of the findings by providing a range of viewpoints. Data gathering included an online survey, interviews, and literature review. Two surveys were conducted with Survey 1 (57 respondents) who were professionals in the field and Survey 2 (100 respondents) who were end-users. The purpose of the survey was to understand what drives preferences, reasons for choosing specific furniture types, cost, durability, and aesthetics. It also examined whether participants preferred handmade or modular furniture. The quantitative results were analyzed to detect trends and patterns in consumer behavior. For qualitative insights, interviews were held with professionals such as carpenters, interior designers and modular furniture employees in the furniture industry. The conversations concentrated on topics like the changing trends in furniture production, the materials utilized, and the expectations of contemporary consumers. In addition to the survey and interviews, a literature review was performed to provide context and background for the research. This involved studying scholarly articles and industry reports that highlight the changes of furniture design and current trends. The literature review helped in understanding the findings of survey

and interview and their interrelation. The three data—survey results, interview findings, and literature—were collectively analyzed to attain a thorough understanding of the topic. This approach allowed the study to explore various viewpoints through which the study could be confirmed and validated. Based on gaps identified in the literature and emerging market trends, the study proposes the following hypothesis:

H_1: Younger urban consumers are more likely to prefer modular furniture than older consumers.

The corresponding null hypothesis is:

H_0: There is no relationship between age group and preference for modular versus handmade furniture.

This hypothesis is tested through comparative analysis of age-wise survey responses, cross-tabulation, and triangulation with interview insights.

4. Data Collection

The data for this study was collected using 3 techniques to support data triangulation and in turn confirm the hypothesis. Two surveys were conducted: one aiming professionals in the furniture, architecture and interior design industry (57 respondents) and the other end user consumers (100 respondents). The survey for professionals sought their insights on market trends, client preferences, recommendations, and the practicality of maintaining handmade furniture in today's market environment. On the other hand, the consumer survey focused on lifestyles, buying habits, preferences, and the factors affecting their decisions between handmade, modular, or a mix of both types of furniture. These two surveys had common grounds which helped in comparative analysis of both the surveys helping in understanding the gap if any between the thought process of users and professionals. Moreover, unstructured interviews were held with people working closely in the furniture industry to get a better understanding of market trends, consumer demands and their alignment with the product they receive. These conversations offered valuable viewpoints on the increasing popularity of modular furniture, the difficulties encountered by the handmade furniture sector, and possible strategies to maintain its significance. Discussion topics covered the decline or difficulties posed in handmade craftsmanship, the functionality and durability of modular features, and opportunities for merging both styles. Lastly, a market analysis on trends in the furniture industry in India was completed as part of the literature review.

5. Data Analysis

5.1 Survey 1: Modular or Handmade - Insights from Industry Professionals on Evolving Furniture Trends

Among the respondents, 87% identified as architects, with 30% of them possessing over 10 years of professional experience and 20% having less than 2 years of experience. Within this group, 29% were affiliated with architectural firms or academic institutions, while 24% operated as freelancers or firm owners. Additionally, 8% were involved in contractor-based roles. This reflects a professionally diverse sample, consisting of a blend of practice, academia, and entrepreneurs. Among industry professionals, those with over two years of experience show a clear preference for handmade furniture (24%) over modular (16%), whereas those with less experience prefer both equally. Industry professionals highlighted quick delivery, modern aesthetics, and affordability as the primary reasons for preferring modular furniture. In contrast, handmade furniture was favored for its potential for customization, distinctive design features, and extended durability. Despite these differences, modular furniture is

largely selected for applications such as kitchens, wardrobes, and sofas, according to industry insights. Professionals reported the main challenges associated with modular furniture to be limited customization options, concerns over material quality, and post-installation dissatisfaction expressed by clients. The challenges associated with modular furniture often stem from its lower durability compared to handmade options. Conversely, while handmade furniture is generally deemed more resilient, it faces challenges such as reliance on skilled artisans, financial limitations, and extended production durations. Yet, experts have pinpointed substantial growth potential in both types of furniture. There was a clear understanding that improving quality and design standardization, along with incorporating customized solutions, could boost the reliability and attractiveness of modular furniture. At the same time, handmade furniture provides distinct value by supporting local artisanship, offering high levels of customization, and aligning with luxury design trends. Survey findings reveal that 64.9% of professionals predict that, over the next decade, the industry will gravitate more towards modular furniture. However, to foster the growth of the handmade furniture market, experts stressed the importance of adapting to modern consumer demands, especially regarding affordability, access to labor, and integration with modular designs. The primary recommendation promotes a hybrid approach that combines the practicality of modular furniture with the benefits of artisanal methods, addressing market demands while preserving traditional craftsmanship.

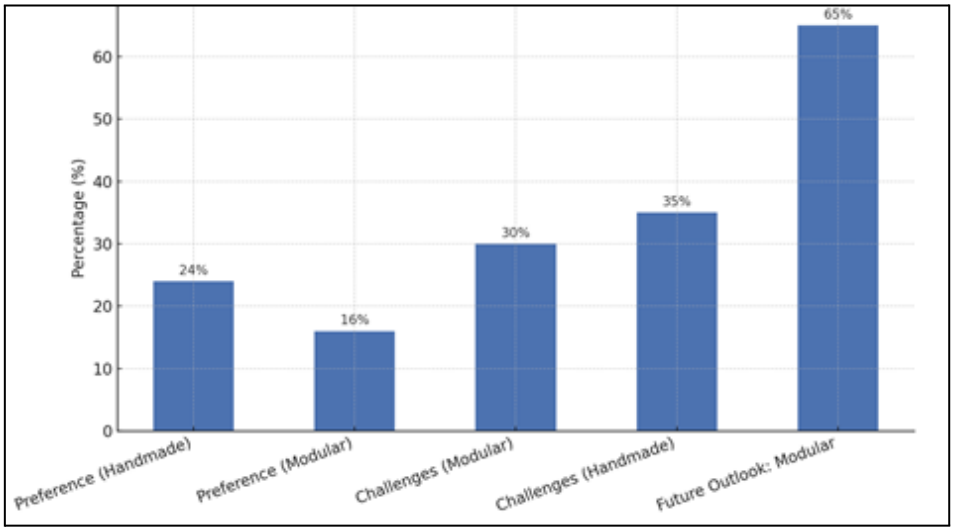

Fig. 1. Survey 1: Industry Professionals - Furniture Preferences, Challenges, and Outlook

5.2 Survey 2: Consumer Insights on Furniture Preferences & Market Awareness

The analysis reveals a delicate divide in consumer preferences between handmade/customized and modular/assembled furniture, based on age, gender, income, and type of residence. Younger individuals (18–34) favor modular furniture (31%) for its affordability and portability, while older consumers (35+) lean towards handmade options (31%) for their craftsmanship and durability. Gender-wise, preferences are nearly even, with a slight female tilt towards modular (22.8%). Residents of owned homes and independent houses prefer handmade pieces for their permanence and value, whereas renters opt for modular due to convenience and lower cost. Higher-income groups (₹15L+) show a strong preference for modular (45%), reflecting modern lifestyles, while middle-income consumers are evenly split, and lower-income groups show limited preference for either, largely due to affordability concerns.

Awareness of modular brands like IKEA is high (91%), but unfamiliarity is more common among those earning below ₹5L annually. Key purchase drivers include cost-effectiveness (71%), durability (69%), and customization (60%). Most consumers buy from local carpenters or showrooms, though 48% have purchased online. In modular furniture, design (84%), value for money (71%), and ease of assembly (61%) are prioritized, though challenges include limited customization (43%), poor durability (25%), and difficulty in assembly (21%). Handmade furniture is valued for durability (61%), unique design (55%), and craftsmanship (47%), but barriers include high cost (51%), long production time (49%), and limited availability (28%). Consumers would consider handmade furniture if it were more locally available (56%), cost-effective (45%), and faster to deliver (39%). Modular's appeal would grow with modern design options (64%), cost-effectiveness (50%), and ease of assembly (46%). Although 69% view modular as the future, improved durability (66%) and customization (61%) are essential for innovation. Handmade furniture retains appeal for its quality, especially among high-income groups, with many willing to pay more if delivery and warranty conditions improve. A generational shift is apparent. To examine the hypothesis (H_1), responses from the 157 participants were grouped by age and preference category. Cross-tabulation revealed a clear directional trend: consumers aged 18–34 preferred modular furniture at substantially higher rates than those aged 35 and above. In both surveys combined, younger respondents consistently ranked affordability, portability, and modern design as priority factors, whereas older respondents emphasized durability and craftsmanship. This pattern, reinforced in both professional and consumer datasets, supports rejection of the null hypothesis (H_0) and confirms that age is a significant predictor of modular preference. These results support the hypothesis that younger people choose modular furniture mainly because it fits their lifestyle.

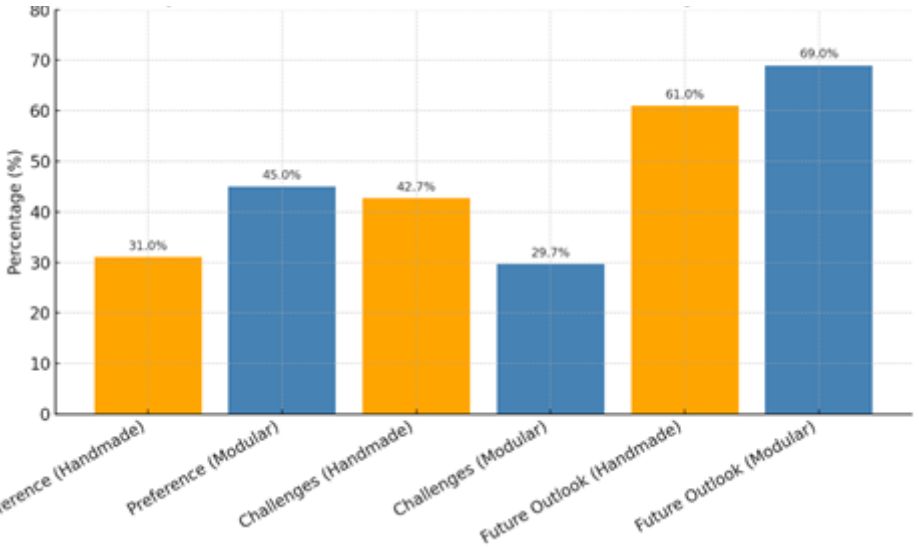

Fig. 2. Survey 2: Consumers - Furniture Preferences, Challenges, and Outlook

Table 1: Comparative analysis of both the surveys under defined aspects

Aspect	*Survey 1: Industry Professionals*	*Survey 2: General Consumers*
Experience-based preference	Professionals with >2 years prefer handmade (24%) over modular (16%)	Younger consumers (18–34) prefer modular (41%); older (35+) prefer handmade (31%)
Occupation	87% architects; 29% firm/academic; 24% freelancers/owners; 8% contractors	Mixed population across ages, income levels, and housing types
Reasons for Modular Preference	Quick delivery, aesthetics, affordability	Affordability, portability, modern design, ease of assembly
Reasons for Handmade Preference	Customization, uniqueness, durability	Craftsmanship, durability, uniqueness
Challenges in Modular	Limited customization, material quality, client dissatisfaction	Limited customization (43%), poor durability (25%), hard to assemble (21%)
Challenges in Handmade	Skilled labor dependency, cost, long production time	High cost (51%), long delivery time (49%), availability (28%)
Purchase Drivers	Efficiency, design standardization, integration with custom features	Cost-effectiveness (71%), durability (69%), customization (60%)
Future Outlook	64.9% believe modular is the future; support for hybrid approach	69% see modular as future; improved durability (66%) & customization (61%) as drivers
Brands Awareness	Awareness is there	91% aware of brands like IKEA; low-income group (<₹5L) mostly unaware
Where they buy from	Customized as per client	Local carpenters, showrooms; 48% have bought online
Modular Preference	Efficiency, scalability, aesthetics	Design (84%), value (71%), assembly ease (61%)
Handmade Preference	Customization, craftsmanship, quality	Durability (61%), design uniqueness (55%), craftsmanship (47%)
Challenges in Handmade	Budget, labor availability, delivery time	Availability (56%), cost (45%), delivery speed (39%)
Challenges in Modular	Material quality, post-installation issues	Durability, customization, assembly
High-Income Preference	Open to investing in handmade if efficiency improves	19/35 high-income respondents willing to pay more for handmade

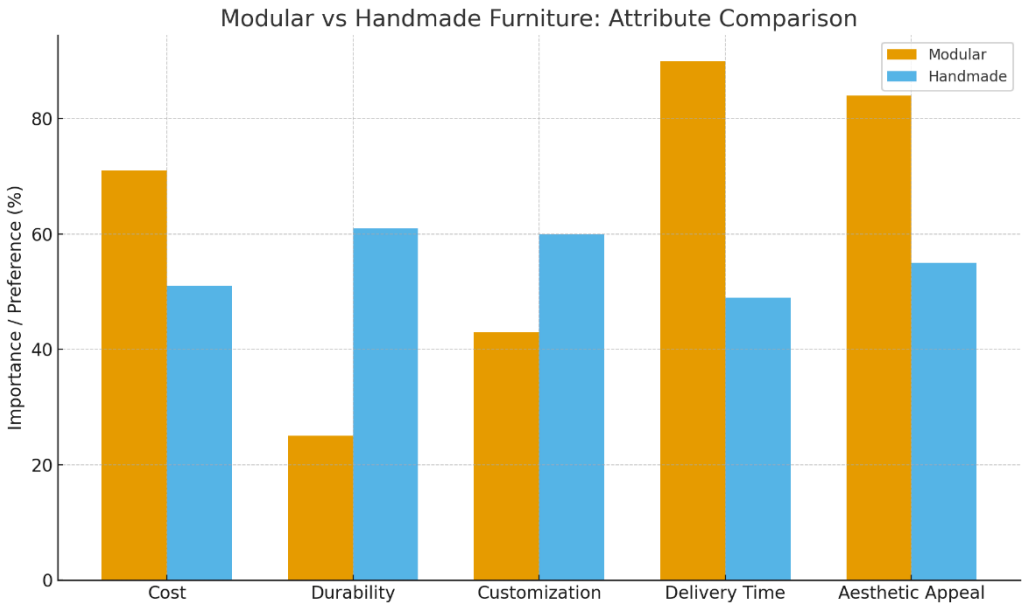

Fig. 3. Comparison between modular and handmade furniture based on survey responses.

5.3 Interview

An unstructured interview was conducted with users, traditional artisan, carpenters, furniture retailers, modular furniture workers to grasp an understanding of how the market has changed over the years. The interview emphasized on the variety of cultural, emotional, economic, and practical elements that together contribute to the transition from handmade to modular furniture in today's times. The initial excerpt that came across was the imbalance between emotional significance and practical utility. Handmade furniture often carries emotional memories, tradition, customization and craftsmanship. Numerous users expressed a sentimental connection to heirloom pieces or items created by local craftsmen. On the contrary, modular furniture is perceived as practical, economical, and well-suited for the fast-paced lifestyles. While users appreciate the charm and individuality of handmade creations, they frequently choose modular options for their suitability for smaller living spaces. This suggests a generational change in values, where practicality and fast life frequently takes over emotional bonds. It underscored the relationship between time, skill, and the diminishing patience in modern consumer habits. Traditional artisans emphasized the uniqueness and time-consuming nature of each handmade product. (fig.4) represents the extent of customization that can be achieved with handmade craftsmen in modern wardrobe design. Their stories revealed a profound pride in their craft, with each item mirroring their identity and commitment. They now however face challenges such as demand in quick production, low cost, easy availability and prompt delivery. The conversations led to highlighting the disconnect that has been created due to their principles and market demand, which in turn leads to the concern of safeguarding traditional skills and knowledge. The furniture manufacturers were probed about the changing trend and their point of view about the artisans and mass production. Their take was that in furniture manufacturing, mass production happens according to the design, layout and finishes which makes it easily available to the consumer. Though there are issues like durability, limited customization, the ease of availability; good marketing and affordability has made modular furniture successful. Also, Modular systems allows consumers to experience a sense of ownership and creativity within a standardized item. As shown in the (fig.4) the modular

design of comes in standard sizes and can be assembled by the clients by themselves giving them the sense of creativity. Another observation was the tension between tradition and contemporary living. The evolving nature of housing, characterized by smaller urban residences, frequent moves, and compact nuclear families, has greatly affected furniture choices. Handmade furniture, recognized for its solidity, bulk and permanent design, does not always meet the flexible demands of modern spaces. Whereas, modular furniture is lightweight, portable, and easily assembled or disassembled. This significant difference shows adaptability is preferred over stability. The materials used for modular furniture are cost-effective and facilitate mass production but raised questions regarding long-term durability. The industry professionals like architects and interior designers also pointed out during the interviews that the craftsman availability is an additional issue. Though everyone desires handmade furniture, consumers are not ready to give it the time and money required for fine workmanship. Only people of higher income group or older generation understand the value of the unique pieces created in handmade furniture. To address the mass a hybrid solution is required where consumers can get unique pieces but still be modular in nature. Also, an awareness about the skills and knowledge our artisans have needs to be spread. Most of Architects/interior designers have then sought a mid-way to incorporate both modular and handmade furniture into a household to better fit with the demands of quick delivery and cost effectiveness. The shift towards modular furniture captures a fast urban lifestyle and consumer behavior influenced by speed, flexibility, and affordability.

Fig. 4. Comparison of handmade wardrobe (left) and modular wardrobe (right) . **(Source: Author)**

6. Results and Discussion

Urbanization in India increased from 34.03% in 2018 to 35.87% in 2022 (World Bank, 2023), considerably transforming consumer lifestyles and resulting in a greater need for contemporary, space-saving, and multifunctional furniture options. This trend is particularly prominent among young professionals and nuclear families, whose preferences have driven the growth of the modular furniture market. The global modular furniture market is projected to reach USD 130.6 billion by 2034, with the Indian market expected to grow to USD 7.53 billion by 2033 (Market Research Future, 2023). Survey findings align with this shift, indicating that modular furniture is favored for its affordability, quick delivery, and contemporary aesthetics, while handmade furniture remains valued for its durability,

customization, and emotional significance—especially among experienced professionals and high-income consumers. Over 64% of respondents across both consumer and professional groups identify modular furniture as the future of the industry, although challenges such as limited customization and material quality persist. The analysis shows that the modular sectors success depends

on efficiency with personalization, with semi-customizable designs increasingly mimicking the uniqueness of artisanal craftsmanship (Rao & Sen, 2023). The interview and its analysis underline the above conclusion of modular being the future due to its ability to adapt with the change like rental culture, fast paced living, but also highlights the plight of artisans, limited accessibility, cost and their readiness for change. Through data triangulation one can find the common aspects on which all the three modules stress on. Firstly, it establishes the shift that modular furniture is going to dominate the industry, secondly it highlights pros and cons for handmade and modular furniture and lastly it demands of hybrid solution that can satiate both where modern consumer demands are responded to while preserving tradition thus enhancing unique value and functional appeal and the artisans' values in tradition. Triangulation of the three data sources strengthens this argument: Survey data reveal clear age-wise preference variations.

while interviews explain why these patterns occur and the literature confirms that urbanization and market globalization favor modular expansion. Together, these form strong evidence to support modular furniture's growth while highlighting the relevance of handmade craftsmanship.

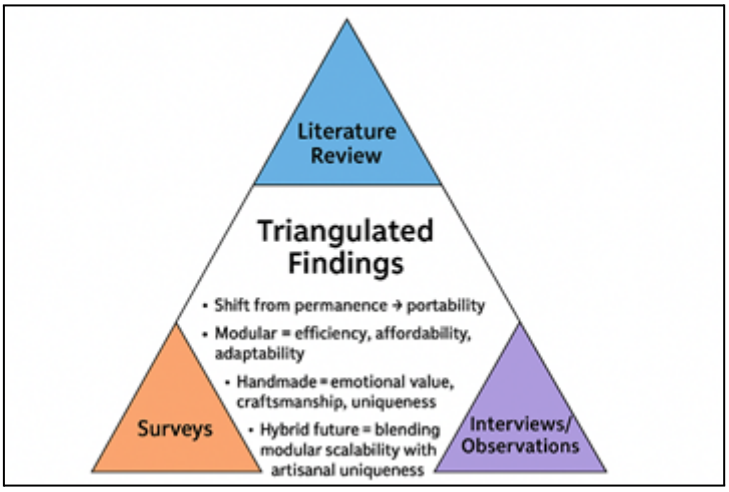

Fig. 5 Triangulation Method used for Data Analysis

7. Conclusion

In conclusion, the shift from handmade furniture to modular furniture signifies societal change due to lifestyle changes, technological advancements, trends and evolving consumer preferences. It also highlights that practicality and affordability have taken a higher ground than art and tradition. Although handmade furniture is everyone's desire due to its distinctive craftsmanship, emotional ties and unique value, modular furniture adapts to the modern, fast paced, impatient lifestyle. It offers affordability, accommodates space constraint, and gives a feel of customization. The analysis indicates the younger population tends more towards modular furniture and are likely to buy from online portals such as IKEA, Amazon, Livspace, etc. for the newness it delivers and for the permutations it offers for smaller living environments. The older generation, although lean towards the handmade furniture, still accept modular's functionality it offers in specific areas such as kitchen, sofas, etc. the increasing popularity of modular furniture is not just about change of preferences but a reaction to modern lifestyle. This transition raises concern for the traditional skills and craftsmanship and the challenges the artisans face to keep up with the changing times. In spite of these obstacles, manufacturers of modular furniture have found ways to include customizable elements, simulating the distinctiveness of handmade items within a standardized manufacturing framework. The findings

support the hypothesis and show that age and everyday lifestyle needs, more than design preferences, are driving this change in the furniture market. This transition raises concern for the traditional skills and craftsmanship and the challenges the artisans face to keep up with the changing times. In spite of these obstacles, manufacturers of modular furniture have found ways to include customizable elements, simulating the distinctiveness of handmade items within a standardized manufacturing framework. The analysis also points towards a combination of the two systems to form a hybrid solution which shall cater to the issues faced by both the systems. This approach suggests a blend between mass production and uniqueness, satisfying todays customer's needs and transforming the furniture sector. (fig.6)

Fig. 6 An example showing a rocking chair traditionally a handicraft work converted to hybrid model where it is converted to modular parts and combined to make a unique piece that looks handmade but is modular.
(Source: Author)

The future is not about which system or style shall hold the stakes but in development of a hybrid furniture system that combines efficiency of modular design with uniqueness of tradition. To remain competitive, a bridge between tradition and trend needs to form to create more sustainable, scalable, customized product to appeal the present fast paced life. The findings suggest that modular manufacturers must invest in material quality, repairability, and modular–handmade hybrid options to maintain long-term market relevance. For policymakers, supporting artisan training programs, cluster development, and integration of digital fabrication tools could help sustain traditional craftsmanship while enabling it to participate in modern supply chains.

References

Aggarwal, S., Agarwal, Y., Malhotra, A., & Sinha, S. (n.d.). A study on emerging trends and consumer perspective towards interior design industry. International Journal for Multidisciplinary Research (IJFMR). Retrieved from http://www.ijfmr.com

Allied Market Research. (2022). Smart furniture market size and share analysis. https://www.alliedmarketresearch.com

Amin, V. S., & Kumar, A. (2022). Case study of furniture manufacturing companies. International Journal of Case Studies in Business, IT, and Education (IJCSBE), 6(1), 158–176. https://doi.org/10.5281/zenodo.6394567

Dahiya, P. (n.d.). Urban furniture trends in India. [Unpublished industry report].

Garip, B., Saglar Onay, N., Garip, E., & Güzelci, O. (2019). Flexible and modular furniture design for changing living environments. [Conference paper or unpublished work].

Global Market Research. (2023). Modular and smart furniture market trends and forecasts. https://www.globalmarketresearch.com

Kumar, A., & Reddy, S. (2021). Sustainable practices in Indian furniture craftsmanship. Journal of Interior Design and Innovation, 15(2), 45–59.

Kumari, N. (2019). Situational analysis of Indian furniture industry. Journal of Asian Development, 5(3), 77–92. https://doi.org/10.5296/jad.v5i3.15607

Li, R. (2022). A study on furniture design based on young people's consumption preference—Takes sofa as an example. In Y. Jiang et al. (Eds.), Proceedings of ICEDBC 2022, AEBMR (Vol. 225, pp. 817–826). Atlantis Press. https://doi.org/10.2991/978-94-6463-036-7_120

Market Research Future. (2023). Modular furniture market forecast report 2023–2034. https://www.marketresearchfuture.com

Patel, M. (2022). Decline of artisanal furniture making in India: An economic perspective. Indian Design Review, 9(3), 112–125.

Rao, V., & Sen, R. (2023). Changing consumer behavior in urban India: A focus on interior trends. Journal of Contemporary Living, 11(1), 22–35.

Sharma, R., & Gupta, N. (2022). Modular living: Evolution of furniture in the age of urbanization. International Journal of Architecture & Urban Studies, 8(4), 66–78

Traffic India & GFTN India. (n.d.). Wood-based handicraft industry: Survey report on Jodhpur (Rajasthan) [Internal report]. WWF-India. https://www.delind.ec.europa.eu (source cited within report)

World Bank. (2023). Urban population growth (India). https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS

Senior Housing - A New Emerging Typology in the Indian Context for Silver Years

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ABSTRACT

The Age-friendly Cities movement, proposed by the World Health Organization in 2007, has influenced cities worldwide and its impact is now reaching Indian cities. The parameters guided by the "Global Age-friendly Cities: A Guide by WHO" (2007) serve as a way forward for making Indian cities inclusive. Currently, the 60-plus population accounts for 8.6% of India's population, nearly 104 million people (Census 2011). In the Indian setting where taking care of the senior in the family has been a way of life due to the traditional joint family systems; the typology of housing has also supported the extendable intergenerational format. However, in the last few years, there is a rise in the nuclear family system especially in metro cities. The current Indian trend of senior living in metros is a builder-driven social reform at various locations including Bhiwadi in Delhi-NCR, Chennai, Bangalore, Pune, Amritsar etc. These retirement communities offer some relief to seniors and are homes where elders find their well-being and social group of a similar age along with the promise of comfort and security. The paper covers new emerging typologies in the Indian context as purpose-built housing for the senior population with the aim of "ageing in place". The Utsav, Ashiana housing in Bhiwadi, Haryana (NCR region) and Anatara senior housing in Dehradun, Uttrakhand, both are new projects introduced in the city for senior living with common amenities. However, these housings are places away from the neighbourhoods where they lived all their lives. The study will document and analyse the diverse needs of the senior population like everyday needs, medical, community, cultural and recreational. The empirical data for the research came from the study of the approach of the housing typology of these mid-rise condominiums covering various aspects of "ageing in place". These will include the overall design of the housing, facilities offered, social spaces, outdoor spaces, safety & security, health care facilities and places of daily needs. Both case studies are very successful examples and are replicating their similar ideology at other locations. The conclusion of the paper would reflect learning's from these examples of the new trends and shifts by the current generation of seniors on living an active, independent & fulfilled life in their silver years.

Keywords: Senior housing, senior population, age friendly neighbourhoods, ageing in place, senior living typology, age inclusive city.

1. Introduction

Housing is a universal requirement and an essential issue around the world. Senior housing which is a function specific housing for elderly is a new concept in India, which specially caters to one segment of the population.

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Currently, the 60-plus population accounts for 8.6% of India's population, which is nearly 104 million, people (Census 2011)[1]. The Age-friendly Cities movement proposed by the WHO in 2007 supports the same cause and its influence has now reached India. The parameters guided by the "Global Age-friendly Cities: A Guide by WHO"(WHO 2007) [2] supports as a way forward for making all Indian cities inclusive. With a huge population of seniors in India there is a demand for housing for them post-retirement. Previously, individuals seeking a peaceful life post-retirement in India would relocate from metro cities to retirement destinations like Pune/Bangalore or to their native towns. Now, financially independent and educated older people are contributing to India's silver economy. The current trend of senior living in metros reflects a builder-driven social reform at various locations, including Bhiwadi in Delhi-NCR, Chennai, Bangalore, Pune, Amritsar and Coimbatore. (Dandona, 2022)[3]. This age-friendly model has gained popularity post-Covid due to the lack of care for senior citizens, and also the need for neighbourhood healthcare facilities.

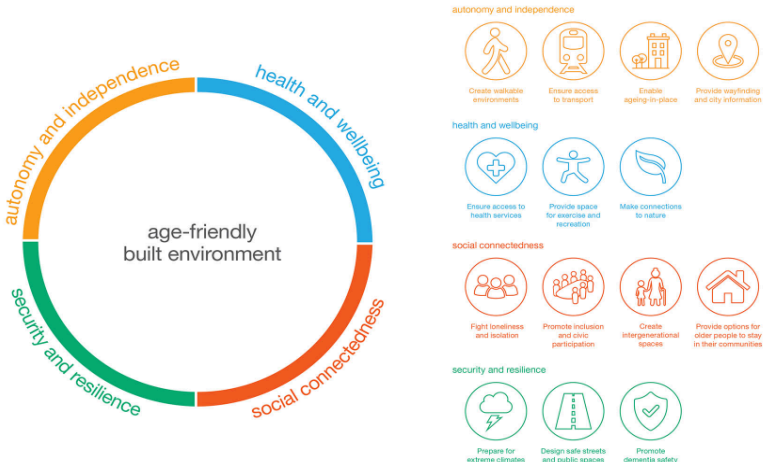

Fig. 1: Global Age-friendly Cities: A Guide, (*Source: Global age-friendly cities: A guide. Geneva, WHO 2007)*

2. "Ageing in place" in the Indian context

The joint family system in India, where elders are considered the head of the family even after they stop earning, has been appreciated globally (Gopalakrishan, K. 2021)[4]. In the Indian setting, a traditional joint family system supported an extendable intergenerational format. This system is declining and the nuclear family system similar to the west is becoming prevalent in India, as children move to metro cities or abroad in search of better opportunities. In some cases, parents willingly move to their native towns in search of peace, away from big cities. In India, there is social stigma attached to elders living

[1] Census of India 2011, National Population Register & Socio Economic and Caste Census. India, 2011
[2] World Health Organization. (2007). Global Age-Friendly Cities: A Guide. Geneva: World Health Organization.
[3] Dandona, N. (2022). Silver economy in India: Way to a healthy city for seniors. ISOCARP. https://doi.org/10.47472/B97Vzcq9
[4] Karunanithi Gopalakrishan. 2021. "Changing Scenario of Family System in India: An Analysis Against the Backdrop of Changing Social Values." *International Journal of Social Sciences* 10(01): 51-62. DOI: 10.46852/2249-6637.01.2021.7

away from their children and people pity them (Mayer A, 2020)[5]. In the customary model of care for the senior, it was the joint family structure, together with the help of the family which dealt with the senior (Chaturvedi and Agrawal, 2020) [6]. It appears that certain cultural studies on aging in South Asia continue to cling to the idealized picture of rural India, where the joint family was considered the ideal basic social structure, ignoring the caste-driven, hierarchical and patriarchal systems of the village. (Michaels A. 2020)[7].The Indian families can fulfil the physical, spiritual and emotional needs of their members, initiate and maintain growth and provide support, security and encouragement (Chaddha R., Deb K. S., 2013)[8]. However, seniors now seek peace of mind and low-maintenance living arrangements where they can age comfortably. (Housing Research, 2022)[9]. Ageing is a natural phenomenon but takes on different connotations depending on the context (Mallick A. 2020)[10]. The nostalgic feeling that elderly individuals carry from their larger houses is a common notion. A broader view of "ageing-in-place" includes retirement communities or senior/assisted living, where older people can feel competent and enjoy their environment, despite functional disabilities (Iecovich, 2014)[11]. The WHO 2002 report advocates for active ageing, referring to the idea that older people should be able to continue participating in social, cultural, spiritual, economic and civic matters. But, familiarity with the wider community, in terms of people and places, provides a sense of security and warmth**.** (Wiles J.L. et al., 2011)[12].According to the World report on Ageing & Health (2015)[13], the right to adequate housing includes having a safe & secure house and community to live in peace and dignity. Therefore, senior housing is also considered a part of "ageing in place," not just the place where one has lived all their life. The excessive expenditure associated with "ageing in place" may sometimes substitute options to age in other locations**.** Senior living homes, also known as retirement homes, provide independent living for seniors seeking a dignified lifestyle after retirement. These homes are designed with the needs of elderly individuals in mind, providing age-specific amenities. This enables them to maintain active, healthy lifestyles with basic medical assistance after retirement. They differ from traditional old age homes primarily due to their age-friendly design, a feature often lacking in such facilities. In India, old age homes serve as a last resort for seniors lacking care from family or others. They are mostly run by NGO's or social enterprises catering only to needy seniors. The old age homes also have a gentrified setup now where their services and pay a monthly rent for your one room studio apartment.

3. Methodology

The goal of investigation of this exploratory research is to get insights into qualitative dimensions of senior housing through evaluation of the two cases of mid-rise condominiums, i.e. Anatara senior

[5] Mayer, A. (2020). Gateways of ageing: Middle-class senior citizens in the National Capital Region of Delhi. In C. Brosius & R. Mandoki (Eds.), Caring for old age: Perspectives from South Asia . Heidelberg: Heidelberg University Publishing

[6] Archana Chaturvedi, Dr. Anjali Agrawal, "*Importance of Senior Housing Societies After Retirement and Its Development in India:* A Review." International Journal of Scientific & Technology Research 9, no. 03 (March 2020) : 3879. ISSN 2277-8616.

[7] Michaels, A. (2020). The 'holy joint family' in South Asian ageing theories. In C. Brosius & R. Mandoki (Eds.), Caring for old age: Perspectives from South Asia

[8] Chadda, R., & Koushik, S. D. (2013). Indian family system, collectivistic society and psychotherapy. Indian Journal of Psychiatry

[9] *"The Silver Economy: A Perspective on Senior Living in India*." Housing Research (2022)

[10] Mallick, Annika. 2020. "*Emergence of the Concept of 'Senior Living Communities' in India: Facts and Facets.*" *Exlibris Social Gerontology Journal* 18, no. 1: pg 39. https://doi.org/10.24917/27199045.181.6.

[11] Iecovich, Esther. "*Aging in Place: From Theory to Practice."* Anthropological Notebooks (2014) ISSN 1408-032X

[12] Janine L. Wiles, Annette Leibing, Nancy Guberman, Jeanne Reeve, Ruth E. S. Allen,. "*The Meaning of 'Aging in Place' to Older* People." The Gerontologist 52, no. 3 (doi:10.1093/geront/gnr098)

[13] World Health Organization. *"World Report on Ageing & Health*. Geneva": World Health Organization, 2015

housing at Dehradun and Utsav senior housing at Bhiwadi. After doing a systematic review with SALSA method from the research paper and to investigate the works done till date to come up with appropriate parameters for the study of the senior housing. The research adopts a combination of qualitative methods to examine the physical, social and spatial parameters associated with the need for senior housing. The study explores housing typologies for older adults to understand how these support them socially & physically for "ageing in place". The investigation integrates both design-based and spatial analysis which is guided by principles of inclusive and universal design and the standard guidelines relevant to elderly care for their wellbeing. The empirical data for the research consists of semi structured interviews**,** individual ones mostly paper-based, supplemented by google forms to collect reliable responses for the key issues. The interviews were focused on a clear set of issues, allowing for a quick and responsive approach to each issue covered in the study parameters. The study engaged a sample size of 20 residents for both the housing as per the living residents which were selected through a random sampling method. To supplement these approaches a passive, on-site observations & recording were also done, which included behaviour study and everyday routines of the residents in their regular settings. This included observing in depth the patterns and routines, as part of the focus group experience study. Then to document and map features relevant to various activities like recreation, sports and social spaces. As the data was predominantly qualitative in nature, after preparing excel sheets the analysis was conducted using Nvivo software, where systematic coding simplified the identification of patterns and assisted in the preparation of conclusions. Using techniques such as thematic analysis or grounded theory to interpret non-statistical data, recognizing themes & patterns. The analysis incorporates assessments of both neighbourhoods for built & open spaces to evaluate accessibility, usability and inclusivity based on the senior population needs covering dwelling unit design, cultural, medical, recreational, safety & security, community and everyday needs. And additionally a post occupancy survey to know the lived experience of the resident was also conducted. This methodology aims to generate insights into the interrelation between built environments, community design and the quality of life of the residents. The research explores hierarchy of spaces in the building and open public spaces relevant for seniors to live in the buildings & enjoy the outdoor activities. After assembling, summarising and recording the results for recommendations and guidelines for policy preparation and to map the social shift in seniors according to needs and trends.

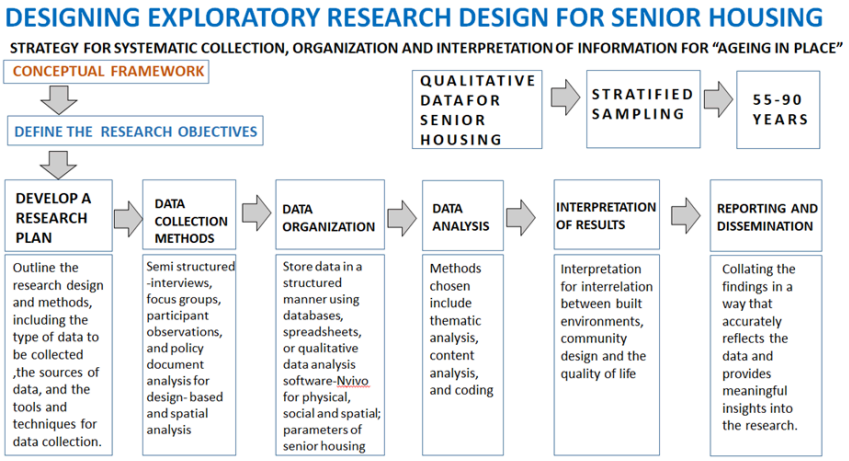

Fig. 2: Systematic exploratory research design for senior housing study, (*Source : Author)*

4 . Senior housing- A new typology as a purpose-built housing for seniors in India

There is an emerging need for the senior living sector in India. Format of senior living format in India are as follows:

- **Urban formats** of small-scale senior living occupy one to five acres within city limits, featuring a vertical layout for easy accessibility. This close proximity fosters social connection and security among residents.
- **Peri-urban** layouts, spanning five to ten acres, are situated on the outskirts of cities. These can include detached homes, apartments, or villas arranged horizontally or vertically.
- **Suburban layouts,** ranging from 10 to 50 acres or more, offer spacious areas and individual residences on the city's periphery. They provide all necessary amenities and medical services on-site, reducing the need for residents to travel outside**. (** JLL 2015) [14]:

The case studies aim to cover emerging typologies in the Indian context as purpose-built housing for the senior population, with the goal of aging in place. These may be remote areas far from urban centres where seniors have spent their lives, yet these housing options maintain a sense of identity for them (Rowles, 1983)[15]. Several major attributes affect the choice & need of senior housing types in India, given its diverse groups of older people with varying needs and social backgrounds

Table 1: Parameters for selecting a senior housing in India: (*Source : Author)*

S. No	Parameters	Specifications
1	Location specific	Urban, peri-urban, suburban
2	Age groups	55-70: Active, 70-85: Some assistance, 85+ : Frail
3	Household typology	Condominium/apartment, individual villa, etc.
4	Housing contract/tenure	Freehold & lease hold
5	Rustic settings	Close to nature
6	Cost & quality,	Materials used/Maintenance covered by the housing
7	Spatial relationships	Intimate, personal, social & public
8	Social status & lifestyle	Income , education & occupation
9	Values	Family, prestige & cultural (personal belief)
10	Health & Wellness centre	Care home and ambulance facility in-house
11	Inclusive with universal design principals	Barrier-free, accessible & adaptable
12	Community needs & amenities	Clubhouse, sports activities, hobbies & community activities
13	Dining facilities	Dining areas for all meals
14	Open spaces	For recreation, walks and socialise
15	Safety & security	Technology use for safety/security.- assistance system

[14] Kumar Manish. and Gattani Pooja. *"Senior Living Sector in India."* Jones Lang LaSalle Incorporated 2015. 10
[15] Rowels, Graham. D. "*Place and Personal Identity in Old Age: Observations from Appalachia*." Journal of Environmental Psychology (1983)

5. Senior housing: An aspiration for India

After drawing from successful literature, the senior living in India is evaluated on the basis of the built environment through architectural and social spaces which these housing are promising. Senior housing in India must be envisaged as an environment that encourages accessibility, inclusivity and overall comfort and well-being of older citizens. The design approach must entail universal design principles, ensuring that the physical spaces can be used safely and with dignity by individuals with varying physical abilities. Accessibility to all essential services and community facilities are critical in enabling older adults to maintain autonomy and continue their everyday activities without asking for help. The legibility of spaces, achieved through intuitive way finding systems, clear visual links and familiar spatial configurations that allow residents to navigate confidently must be integrated. Familiarity and recognisability in the built form foster place attachment and a sense of homeliness, both of which are essential to support the concept of "ageing in place". Beyond the physical environment, social connectedness, participation and a sense of belonging within the community contribute significantly to the psychological wellbeing of older adults, helping them feel valued and integrated within their neighbourhoods. Ensuring safety and security through thoughtful design and the strategic use of technology is equally vital, while addressing both physical safety and mental well-being through responsive support systems. Additionally, access to healthcare services, open spaces for recreation and spaces for physical activity and sports reinforces mental and physical wellbeing. Collectively, these dimensions reinforce independence, allowing seniors to live comfortably, confidently and meaningfully within their communities. Two recent developments in the city for elderly living with shared amenities are Ashiana Housing in Bhiwadi, Haryana (NCR region) and Anatara in Dehradun, Uttrakhand. While Utsav Ashiana Senior Living provides an inexpensive alternative for the middle class in the Delhi-NCR area, Anatara Senior Living, located in the foothills of the Terai region, caters to the elite of North India.

6. Antara Senior living – Medium rise senior housing

Location- Purukul village, Dehradun, Uttrakhand, ,India
Year of completion - 2017
Density- 196 units in 14 acre
Type of dwelling units & number of blocks –2 BHK to 5 BHK units in eight blocks
(BHK – bed room, hall and kitchen)
Height of the blocks- Ground plus five floors
Architect : Perkins Eastman, New York

Fig 3: Site Layout plan and building blocks of Antara Senior Living, Dehradun, (*Source : Antara Senior living Brochure)*

6.1. Architectural lens

Antara's design philosophy - **"**Antara Dehradun has been designed to align itself with the physical, spiritual and emotional needs of its residents**."** Antara Dehradun is a holistic ecosystem that offers its residents the utmost quality of living & a lifestyle integrated with nature. (Antara 2008)[16].

6.2. Neighbourhood scale

The master plan of the project has been planned keeping in mind universal design principles so as to allow residents barrier-free access within the community. The layout of the housing is done in carefully orienting the blocks as per sun angles, views of the River Tons, Mussoorie hills, the lush Malsi forest and landscaped areas within the community. The structure of the layout is simple and legible for the elderly. The major circulation is through the Central spine which leads to each block but the focus is the club house. The landscape features a yoga pavilion, creative zones, terrace gardens, plazas, organic/herbal gardens, orchard walks, etc are planned in the housing. Sustainability is integral to the design, with rainwater harvesting, minimal grading changes and native planting. There is segregation of vehicular and pedestrian traffic to ensure safety. Existing trees are protected in master plan and layout development of the project (Antara 2009)[17].

6.3. Building block design

Each building block has a mixture of apartment sizes from 2BHK to 5BHK units, so as to promote social bonding. The ground floor lobby and the porch to the building are the areas where people interact with their neighbours moving in and out of the block. Therefore there is a seating and interaction area is planned in each housing. The corridors on upper floors also act as shared areas. The height of the blocks is midrise to make it a walk up feel for the residents. Each block has a compact plan with doubly loaded corridors.

6.4. The dwelling unit design

Residents can benefit from open area planned in the units, thanks to large patios and balconies. Every apartment is designed to provide occupants with the maximum amount of privacy possible while maximizing views of the mountains, river or valley. Apartments on the ground floor are provided with private garden spaces and sun decks. The neighbourhood's network of connected basements makes it simple for residents to move around in any weather. The weather there turns balconies or porticos into summer retreats in the evenings, while drying clothes and enjoying the warmth embrace the winter sun to warm up on the balcony. Apartments have access control with smart cards for safety and security. Two lifts per residence block have been provided for any emergency. The wooden railings in the lobby and corridors have been provided for the elderly. The apartments in the community have been thoughtfully designed to allow residents to live comfortably at every stage of life. When determining

[16] *Antara senior living.* Brochure - https://www.antaraseniorcare.com/static/uploads/category/pdfca0cddf8391e5be98fd42a0060d925f8.pdf

[17] ibid

apartment architectural requirements, such as wheelchair turning radius, etc. the Americans with Disabilities Act (ADA) is taken into consideration. There is use of continuous flooring to prevent tripping and falls at every level. Extra space is available near the entrance of each dwelling unit for the storage of mobility aids like wheelchairs and walkers. There is an emergency response system, fire & safety alarm, personal emergency alarm and safety verification for those going out of the campus.

Fig 4: Dining hall, bar, reading room among some of the amenities at Antara Senior living*, (Source : Author)*

6.5. Shared Amenities

The facilities offered for the senior population in the condominium are mainly: the temple, multipurpose hall, library cum reading room and private dining room, the lobby cum lounge at the club to socialise like a movie theatre, card room and bar for parties. Most essential are the common dining area and other common facilities like laundry & ironing service, which are new to the Indian context as these facilities were offered by hostels and never by housing.. The street front for each block has a driving facility & pedestrian path connected to each block. The need for retired & also working professionals in the housing are dealt with by the reading room cum library where a lot of residents do their work on the computers provided. The Dwelling units are efficient in its functional design, legibility & adaptability. Some residents did dismantle a few walls to make their living rooms or study larger.

6.7. Care continuum

There is a dedicated health and fitness trail carved out in the landscape. The activity zones include badminton cum tennis court, outdoor gyms and putting green area**.** For health benefits and sports there is provision of a gym, courts, indoor swimming pool and salon. The primary medical care facilities are in-house like dentist, doctor for physiotherapy and therapy treatments are accommodated in the campus. The other medical facilities are taken care by Max hospital which is in the vicinity and is a partner in the venture. There is a round the clock ambulance service available. The multipurpose hall is used for yoga in the morning. There are benches and pause points at every corner in the campus to rest & socialise. But some residents who shifted here because of health reasons have significantly felt the difference in no time.

Fig 5: Health care at Antara Senior Living, Dehradun*, (Source :Antara Senior living Brochure)*

6.8. Social Life

The social spaces as outdoor spaces are enjoyed by the residents especially for walking. There is no interference with vehicles as all parking is in the basement. The everyday needs are dealt with by a grocery store and fresh vegetables supplied every day to the residents. The well-being being a major concern after Covid and none of the residents got infected inside the housing because of the security and care taken by the staff. The seniors can participate & get involved in activities and daily functioning at Antara at the club which help them have an active social life inside the housing and also create their own community where they live.

Fig 6: View of the lobby and dining hall at the Club at Antara & outdoor walking trails, *(Source : Author)*

6.9. Discussion

Antara is a gated and gentrified senior housing community that fosters a strong sense of community among its residents. The hierarchy of spaces and design development ensures a coherent relationship and seamless flow of spaces throughout the housing. The project successfully nurtures a sense of security and community among residents, with cohesive visual links connecting all blocks to the main spine and the surrounding neighbourhood. The landscape surrounding each block and the main hillock behind the club is inviting and well-designed, with slopes, plantation and landscape features suitable to the terrain. Internal facilities and open spaces are centrally located and well-connected, facilitating interaction among residents. Seniors primarily engage in activities at the club, given its proximity to dining and other activity rooms. The precinct provides a sheltered environment with covered corridors and walkways, considering the rain received by the Doon valley**.** Individual apartments are self-sufficient, with facilities within walking distance. Diversity is not seen as it is a segment of higher income seniors who can afford this housing are welcomed here. Events are open to outsiders if they have taken membership of the club, which is not much liked by the residents as shared in interviews. Polarization between the city outside and the world created inside can be seen. Intergenerational interaction is limited as the housing is meant for seniors above fifty five years of age. Guests, children

and grandchildren are welcome but cannot stay for extended durations. Residents express confidence in the safety of the community with some like Mr. Anand and his wife from Delhi who visits Antara regularly to spend time with friends at Antara but this is not their permanent home. But for the ones who have made it their home are enjoying a safe, comfortable home with their friends at Antara.

7. Utsav Senior Living, Medium rise senior housing

Location- Bhiwadi, Haryana, India
Year of completion - 2008.
Density- 640 units in 15 acre
Type of DU's - 1BHK to 4 BHK in 14 Blocks
Height - Ground plus four floors

Fig 7: View of Utsav Senior Living & layout plan (*Source : Author, BrochureUtsav Ashiana Senior living)*

7.1. Architectural lens

Design philosophy of Utsav senior living follows the four pillar of ageing namely, Social, financial, spiritual, emotional & physical wellbeing as basis of the way of life behind the development of this senior housing[18]. Utsav senior living represents a paradigm shift in the way we perceive retirement living in India.

7.2. Neighbourhood scale

The master plan has been designed keeping in mind the shape of the plot. The blocks have been placed strategically on the periphery so that every block has a view of the central green which is easy to navigate. The layout of the housing is done in a carefully oriented way to take into consideration the sun angles and summer & winter needs of north India's climate. The circulation is through the roads running next to the blocks throughout the housing. The parking is on the road next to the blocks and there is no provision of basement or stilt parking.

[18] *Ashiana Senior Living*. Brochure ,

https://www.ashianahousing.com/comfort-homes-residential-properties-india/bhiwadi-delhi-ncr

7.3. Building block design

The Project has a ground plus four floors with two lifts for each block. There is a well-designed landscaped 2.1 acre central park with seating arrangement and space for meditation & yoga. There are no formal lift lobbies on each floor thus saving maintenance cost. But the corridors are connected in some blocks with each other with seating areas for rest. Each block has a different type of apartment sizes so as to promote bonding. The ground floor and the porch to the building are the areas where people interact with their neighbours. The height of the blocks is midrise to make it look more human scale. Each block has a compact plan with doubly loaded corridors.

7.4. The dwelling unit design

Dwelling units have simple and functional design for immediate occupancy, enabling older adults to age in place without the need for further modifications. These apartments welcome natural light and have good ventilation. The complex has neatly constructed various types of apartments with sizes and from one bed room to four bed room typology. Every design element, including rails and ramps, has taken the needs of the elderly into consideration. Even though it's a middle income apartment, it does have all the necessities of elderly friendly design and architecture at every level.

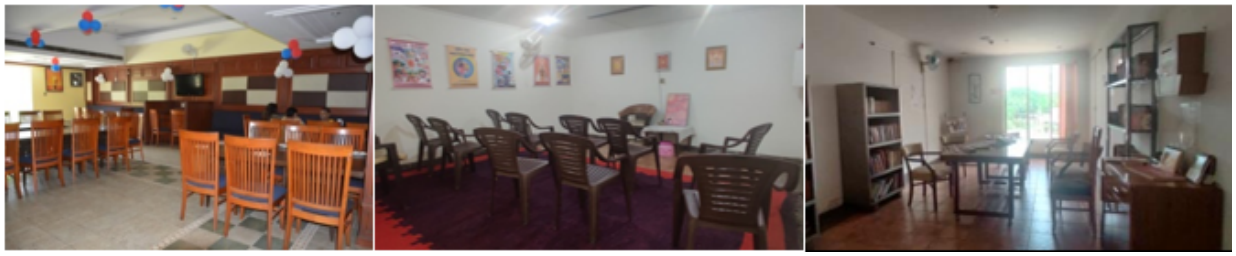

Fig 8: Common dining, meditation hall & library at Utsav Ashiana senior living, (*Source : Author)*

7.5. Shared amenities

The club house at Utsav is the main attraction which has all the amenities offered by the housing from common dining to social activities. The Utsav team works round the clock to keep the residents engaged in exciting activities. The outdoor club facilities include a swimming pool, tennis & badminton courts, billiards arena and amphitheatre. A club house is an activity centre for social interactions and various hobby classes that are also organised in the activity rooms. Other facilities include library cum reading lounge, movie room, community hall, mediation room, TV room, Computer room, Card room cum board game lounge, gymnasium, grocery store & a temple for religious activities. The landscape features installed in the central park which has a gazebo and seating area in the central green, which are used on an everyday basis and throughout the day. There are open spaces as central green and pocket parks in each block too. Many residents also like gardening. The spacious residences are equipped with lush green landscapes to invite relaxation and contemplation**.** They follow the fundamental principles of universal design parameters all over the development.

7.6. Care continuum

The healthcare and medical support services is the backbone for Utsav senior housing for this reason has care home is a separate wing in the housing with ten rooms for care of seniors with medical facilities & attendants for individualized care. The care home component is open to outsiders who need care and need to live in the care home. As a part of the wellness initiatives trained doctors are available at the care home with an on-site ambulance facility for the comfort, safety and well-being of the residents. There is an emergency response system provided in each apartment for any emergency, but not in each room. The landscaped areas are used for outdoor activities like yoga, jogging and walking. Seniors also walk to the common dining hall every day.

Fig 9: View Care Home at Utsav, Ashiana Senior living Figure 5 *(Source : Author)*

7.7. Social Spaces

Diversity can be seen at Utsav senior housing as various individuals or couples, who have come from various places & backgrounds to enjoy their silver years who have built a community here. Particular attention has been given to the idea of enjoyable life for seniors in this complex. There's always something entertaining organized at Utsav housing like hobby clubs, leisure events, cultural events to wellness initiatives and educational seminars which are hosted at the community hall of the club house to provide a diverse culture here. This also becomes the meeting point for the community every day. The common dining hall is also located here with all other amenities & everyday grocery. Every aspect of social life is tailored to enhance the quality of life for its residents and the community which is formed here.

Fig 10: View of amphitheatre, outdoor spaces & club for socialising at Utsav,Ashiana Senior living, *(Source : Author)*

7.8. Discussion

Utsav is surrounded by peaceful surroundings & provides a satisfying lifestyle for elders in this housing. The sequence of spaces from entry to various blocks and then to the individual dwelling units is quite seamless as the blocks have been carefully placed along the periphery of the layout. The low height of the structure campus visually moderates the height & makes the development very home-like and not an alien tower project on the outskirts of the city. The choice of Utsav senior housing is a boon for the elderly who were looking for an affordable option close to Delhi NCR. Careful attention has been given to the fact that the housing is for middle class seniors and the maintenance of the estate shall not take a toll on the people who will be staying here, so low maintenance features were added. Material & finishes are permanent and not expensively chosen. The gated environment is a safe place for elderly. The landscape focus is on the central garden as the heart of the housing, but other associated pocket parks provide a respite to the residents for everyday activities. Even while children and friends are welcome to visit and stay, the accommodation exclusively accommodates an elder, which further restricts the opportunities for intergenerational interaction. The events organised at the club provide the seniors, opportunity for independence, association and enriching experience. The inclusive and universal design principles allow residents a barrier-free access within the community at neighbourhood level. Separation between the city outside and the world created inside is not much being away from the main city. The Utsav community comes out as a robust, social & interactive group of seniors, enjoying their silver years.

8. Conclusions

The learning's from both cases actually paves way forward for age-friendly neighbourhoods in Indian context. Reflecting the new trends of seniors where they have a choice now, to live in the new typology offered to them in a vibrant, carefree & satisfied environment in their silver years. Senior living communities are becoming more and more popular in India and also meeting the changing demands, after careful studying the aspirations & preferences of Indian elderly. These senior housing might look exclusively built for seniors but they do provide the care and health support which old age homes cannot provide to them. The best feature provided by these, which is a major issue with older citizens, is a community dining facility and open spaces. To arrange for groceries and cook at their age is a task, which is taken care by these common dining facilities. Moreover, to dine with their own community has an advantage to socialise on all meals. The post-survey observations emphasize that senior housing must move beyond functional adequacy to embrace a holistic and inclusive model that supports dignity & wellbeing for seniors. These senior housing offers respite to seniors and are places where they find their comfort zones, social group of similar age group, along with the assurance of security in a safe, gated environment. The choice of housing is not just the dwelling unit design but also incorporates features which are not tangible like independence, accessibility and familiarity in the precinct. Other attributes like way-finding and legibility are carefully designed as part of the layouts design; choice and quality of materials suitable for this age group are chosen as a household requirement. Similarly, incorporating Indian values & customs to the ethos is also a major characteristic for a cultural connects. Housing which is affordable and adaptable, in proximity & guarantee access is the need for seniors right now

(ARUP 2015)[19]. The intergenerational spaces offered by a generic housing are missing in senior housing and so do the loved ones of these seniors. Careful attention is given to fight loneliness and built a social connect between neighbours and the community at large. Neighbors are the most crucial factor in choosing a place to live away from family (T.Buffel 2012)[20] . These social connects help them built meaningful relationships in turn, which enables fostering positive mental health to enhance happiness of the seniors.

8.1. Time to adapt to the change and reframe the Indian policy frameworks for seniors

The future of old age will, to a large degree will be determined by the extent to which living in cities is made to feel a natural part of growing old. Buffel (2012). The right to the city for the seniors needs to be secured with participation in cities for various purposes; seniors might feel they have been secluded in a singular use typology like a hostel dedicated for them. The city policies need to accommodate needs for seniors as a part of the city development plan .The drive to choose the place & type of housing for seniors, is paving a path for future discourse in senior housing in India. The learning from the new senior housing typology adopted by seniors in India has open a new paradigm shift from the conventional typology to a purpose built typology, which is a new innovation for Indian apartment typology. An age-inclusive city begins with master planning that integrates age-friendly zoning, ensuring older adults live close to essential services which they need every day. The neighbourhood plans should promote mixed-use areas, accessible public transport, socially cohesive communities and reliable neighbourhood networks with strong emergency-response systems. The housing interventions must provide flexible, adaptable layouts with co-habitation options and barrier-free design features such as step-free entries and wide doorways, supported by assistive technologies to maintain mobility and independence. All outdoor environments should strengthen place attachment through safe walk able paths, shaded green spaces and also sufficient pause areas with seating. The government initiatives can further enhance “ageing-in-place” through senior helplines, safety protocols, legal and financial literacy programs and opportunities for active seniors to contribute through mentoring, consulting and part-time roles in their regions.

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[19] Arup. 2015. *Shaping Ageing Cities*.

[20] Buffel, Tina, Phillipson, Chris, & Scharf, Thomas "*Ageing in Urban Environments: Developing ‘Age-Friendly’ Cities."* Sociology: Critical Social Policy (May 22, 2012).

References

Adlakha, D., Murali, K., Woolrych, R., & Ellis, G. (2020). Neighbourhood supports for active ageing in urban India. Psychology and Developing Societies, 32(2), 254–277. https://doi.org/10.1177/0971333620937497

Antara Senior Living. (n.d.). Brochure. Retrieved from https://www.antaraseniorcare.com/static/uploads/category/pdfca0cddf8391e5be98fd42a0060d925f8.pdf

ARUP. (2015). Shaping ageing cities. Retrieved from https://www.arup.com/perspectives/publications/research/section/shaping-ageing-cities

Ashiana Senior Living. (n.d.). Brochure. Retrieved from https://www.ashianahousing.com/comfort-homes-residential-properties-india/bhiwadi-delhi-ncr

Buffel, T., Phillipson, C., & Scharf, T. (2012). Ageing in urban environments: Developing 'age-friendly' cities. Critical Social Policy. https://doi.org/10.1177/0261018311430457

Carr, K., Weir, P. L., Azar, D., & Azar, N. R. (2013). Universal design: A step toward successful aging. Journal of Aging Research, 2013, Article ID 324624. https://doi.org/10.1155/2013/324624

Chadda, R., & Koushik, S. D. (2013). Indian family system, collectivistic society and psychotherapy. Indian Journal of Psychiatry.

Chaturvedi, A., & Anjali, A. (2020). Importance of senior housing societies after retirement and its development in India: A review. International Journal of Scientific & Technology Research, 9(3), 3879.

Confederation of Indian Industry (CII). (2011). Senior living in India. New Delhi: CII.

Desmet, P. M. A., & Hekkert, P. (2007). Framework of product experience. International Journal of Design, 1(1), 57–66.

Facer, K., Manchester, H., & Horner, L. (n.d.). Towards all-age friendly cities (Working Paper 1 of the Bristol All-Age Friendly City Group). Bristol: University of Bristol, School of Education & Cabot Institute for the Environment. Retrieved from https://research-information.bris.ac.uk/en/publications/towards-all-age-friendly-cities-working-paper-1-of-the-bristol-al

Gopalakrishnan, K. (2021). Changing scenario of family system in India: An analysis against the backdrop of changing social values. International Journal of Social Sciences, 10(1), 51–62. https://doi.org/10.46852/2249-6637.01.2021.7

Government of India. (2011). National Policy for Senior Citizens 2011. New Delhi: Ministry of Social Justice and Empowerment.

Government of India, Ministry of Urban Development. (2016). Harmonized guidelines and space standards for barrier-free built environment for persons with disability and elderly persons. New Delhi: Government of India.

Iecovich, E. (2014). Aging in place: From theory to practice. Anthropological Notebooks, 20(1), 21–33.

Khare, R., & Mullick, A. (2012). Universal design India principles: A contextual derivative for practice. Proceedings of the Human Factors and Ergonomics Society Annual Meeting, 56(1), 479–483. https://doi.org/10.1177/10711813125611

Kumar, M., & Gattani, P. (2015). Senior living sector in India. Jones Lang LaSalle Incorporated.

Mallick, A. (2020). Emergence of the concept of 'senior living communities' in India: Facts and facets. Exlibris Social Gerontology Journal, 18(1), 71–82. https://doi.org/10.24917/27199045.181.6

Mayer, A. (2020). Gateways of ageing: Middle-class senior citizens in the National Capital Region of Delhi. In C. Brosius & R. Mandoki (Eds.), Caring for old age: Perspectives from South Asia (pp. 285–304). Heidelberg: Heidelberg University Publishing.

Michaels, A. (2020). The 'holy joint family' in South Asian ageing theories. In C. Brosius & R. Mandoki (Eds.), Caring for old age: Perspectives from South Asia (pp. 285–304). Heidelberg: Heidelberg University Publishing.

Ministry of Statistics and Programme Implementation, Government of India. (2021). Elderly in India 2021. New Delhi: Government of India.

Moyen, M. M. (2015). A study of universal design in everyday life of elderly adults. International Journal of Design.

National Institute of Urban Affairs (NIUA). (2021). Inclusive city framework. New Delhi: NIUA. Retrieved from https://niua.in/intranet/sites/default/files/2185.pdf

National Institute of Urban Affairs (NIUA). (2022). A guide for inclusive, accessible, safe and resilient urban development. New Delhi: NIUA. Retrieved from https://niua.in/intranet/sites/default/files/2346.pdf

National Policy for Senior Citizens. (2011). National Policy for Senior Citizens 2011. New Delhi: Ministry of Social Justice and Empowerment, Government of India.

NITI Aayog. (2024, February). Senior care reforms in India. New Delhi: NITI Aayog. https://www.niti.gov.in/sites/default/files/202402/Senior%20Care%20Reforms%20in%20India%20FINAL%20FOR%20WEBSITE_compressed.pdf

Raheja, G., Purkayastha, D., & Pokharna, A. (2024). Universal design futures: Theoretical insights and paradigms from a majority world. Studies in Health Technology and Informatics, 314, 271–278. https://doi.org/10.3233/SHTI240982

Rafi, S., & Saif, S. (2020). Age-friendly communities: Creating a conducive environment for the elderly in India. Journal of Geriatric Medicine, 2(2). https://doi.org/10.47363/JGM/2020(2)135

Rowles, G. D. (1983). Place and personal identity in old age: Observations from Appalachia. Journal of Environmental Psychology, 3(4), 299–313.

The Silver Economy. (2022). A perspective on senior living in India. Housing Research. https://cdn.spark.app/media/housingcom/pdf/the_silver_economy_a_perspective_on_senior_livg_in_india_housing_research_2022.pdf

Vasunilashorn, S., Steinman, B. A., Liebig, P. S., & Pynoos, J. (2012). Aging in place: Evolution of a research topic whose time has come. Journal of Aging Research, 2012, Article ID 120952. https://doi.org/10.1155/2012/120952

Wiles, J. L., Leibing, A., Guberman, N., Reeve, J., & Allen, R. E. S. (2012). The meaning of 'aging in place' to older people. *The Gerontologist, 52*(3), 357–366. https://doi.org/10.1093/geront/gnr098

World Health Organization (WHO). (2007). *Global age-friendly cities: A guide.* Geneva: World Health Organization.

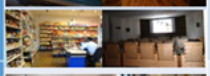
World Health Organization (WHO). (2015). *World report on ageing and health.* Geneva: World Health Organization.

World Health Organization, Regional Office for South-East Asia. (2018). *Regional framework on healthy ageing (2018–2022).* New Delhi: WHO-SEARO.

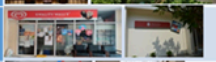
Annexures:

1. Analytical table for Antara Senior housing to evaluate "Ageing in place " for Senior Residents perception of their neighborhood
2. Analytical table for Utsav, Ashiana Senior housing to evaluate "Ageing in place " for Senior Residents perception of their neighborhood

Annexure 1: Analytical table for Antara Senior housing to evaluate "Ageing in place " for Senior Residents perception of their neighborhood

ASPECTS		NEIGHBOURHOOD	PRECINCT	BUILDING	DWELLING UNIT
LOCATION & ACCESSIBILITY		Housing is closer to the main city & good connectivity with the main city.	Connected by ramps and pedestrian paths with all other blocks.	Buildings have advantage of hill view and climate plays a major role in the layout.	
HIERARCHY OF SPACES		Planning has been done with careful understanding of the site, its need and topography.	All blocks placed in a way to get view of the mountains, river or the valley.	Way finding is easy with signage and open layout.	
PLANNING & DESIGN		The clear layout makes the housing familiar and easy to navigate.	The central spine lead to all the housing blocks.	Doubly loaded corridors for ease of planning.	Simple layouts of all apartments. All building systems are incorporated .
WELLNESS & HEALTH CARE		All facilities - Walkways, parks, yoga facility, putting court, gym, spa & swimming pool.	On site health care services, regular check up & 24 hours ambulance available.	Medical facilities, fitness centre & in house care at the care home.	Access to health services plus open spaces for exercise and recreation.
ACTIVITIES, RECREATIONAL & SOCIAL CONNECT		All facilities at walking distance. Like hobby classes - music & pottery are a major attraction.	Senior focused club, pool table room, reading room, library, card room, temple, movie hall, dining hall & bar.	In house club for seniors offers activity all day long.	Corridors and lobby areas to meet the neighbours and to interact.
COMMUNITY NEEDS & PARTICIPATION		Antara works as a strong community of residents.	Participation of all resident in all activities can be seen – walking, pottery, music, yoga etc	Club and activity rooms keeps all the residents together.	Designing an accessible spaces for community to interact.
INDEPENDENCE - EVERY DAY NEEDS		The shuttle service inside and arrangement made to go outside to the main city too.	The grocery store, salon, dining hall for all meals & all major activities they can do on their own independently.	Everything available in-house plus runners are available for residents to do their chores.	Stay in their own home safely & independently and still feel connected.
COMMON DINING		USP of the place as it is an advantage for occupants who live alone, bar and a restaurant is also there.	Dining is well connected and it is placed in the centre.	NA	NA
POST OCCUPANCY SURVEY		All resident are very satisfied – the club is open to outsiders which they found was not a good idea.	A feeling of belonging for the neighbourhood is there with the residents.	New technology incorporated – Panic buttons, smart equipments.	Gentrification is there but diversity is also seen, people from all over India.
SAFETY & SECURITY		Gated community with security staff, there is no entry to outsiders.	Each block is guarded with security guards.	Major advantage is safety with panic buttons.	Emergency response available in each apartment for quick response.
UNIVERSAL DESIGN		Followed everywhere at neighbourhood and DU level too.	Age-friendly features & Wheelchair enabled walkways	Wheelchair enabled, ramps everywhere & handrails provided.	Apartment with senior friendly features and lifts.

Annexure 2: Analytical table for Utsav, Ashiana Senior housing to evaluate "Ageing in place " for Senior Residents perception of their neighborhood

ASPECTS		NEIGHBOURHOOD	PRECINCT	BUILDING	DWELLING UNIT
LOCATION & ACCESSIBILITY		Far away from the main city of Delhi NCR where most of the resident belong .	All blocks placed at the periphery to get a view of the central green.	Buildings with large openings according to the climate.	
HIERARCHY OF SPACES		Spaces have been segregated according to the need, bigger green to smaller greens etc.	Central open space as the heart of the housing.	Way finding is easy with signage and placing all units around the green.	
PLANNING & DESIGN		The layout makes the housing easy to navigate for the seniors.	The central green connects all the blocks.	Doubly loaded corridors for ease of planning.	Easy to navigate spaces Simple layouts of each floor
WELLNESS & HEALTH CARE		Open spaces for exercise 7 recreation- Walkways, parks, yoga facility, putting court, gym, spa and swimming pool	On site health care services, regular check up, ambulance 24 hours.	Medical facilities, fitness centre, in house care at the care home.	Care home and ambulance present
ACTIVITIES, RECREATIONAL & SOCIAL CONNECT		Cultural activities – movie shows, birthday parties, Diwali, Holi etc. All facilities at walking distance. Hobby classes for resident.	Senior focused club, library ,card room, temple, movie hall, dining hall.	In house club for seniors offers activity all day long.	Corridors and lobby areas to meet the neighbours in the building.
COMMUNITY NEEDS & PARTICIPATION		Designing an accessible living space and pause points all around the housing.	Club cum community hall is a part of the everyday life because of all the facilities.	Club and activity rooms keeps all the residents together and form the place for community.	Designing an accessible living space for all residents apart from their apartment.
INDEPENDENCE - EVERY DAY NEEDS		Independence to go anywhere in the housing ,arrangement made to go outside.	The grocery store, dining hall for all meals & all major activities & hobby.	Everything available in-house, runners are available for residents to do their chores.	Stay in their own home safely with help at close level.
COMMON DINING		Dining - USP of the place as it is an advantage for occupants who live alone and do not need to cook all meals.	Choice of common dining is available in the senior housing.	NA	NA
POST OCCUPANCY SURVEY		All resident are very satisfied – the club is open to outsiders which they found was not a good idea.	A feeling of belonging for the neighbourhood and finding new friends in the housing.	New technology incorporated – Panic buttons & intercoms.	Gentrification is there in the housing but diversity is also seen, people from all regions are living at Utsav.
SAFETY & SECURITY		Gated community, 24/7 security staff, no entry to outsiders.	Each block is not guarded with security guards.	Major advantage is safety being in a gated community.	Emergency response available in the housing for quick response for seniors.
UNIVERSAL DESIGN		Barrier free design followed every where at neighbourhood and building level.	Universal accessibility features adopted in the design of the housing.	Wheel chair enabled, Ramps everywhere & handrails provided.	Senior friendly features inside the apt- grab rails, non slip floors, curved walls.

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